APR 27 1942

THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS

MAJOR ARTICLES

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Forecasting the Demand for Electric Energy . . . . . J. E. GATES

DEPARTMENT ARTICLES

Translating Research into Progress through the Journal of Land & Public Utility Economics . . . . . MORTON BODFISH
Land Economics in Transition . . . . . V. WEBSTER JOHNSON
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Public Utility Financing in the Fourth Quarter of 1941 and a Summary of the Year, 1941 . . . . . R. G. DUDLEY and W. H. EVANS

VOLUME XVIII, NUMBER 1 FEBRUARY, 1942 PRICE $1.50 A COPY

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Published in February, May, September and November
Subscription $3.00 a year (Foreign $3.50)—Single copies 75 cents

66 West 12th Street, New York, N. Y.

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PUBLISHED QUARTERLY BY THE UNIVERSITY OF WISCONSIN
DURING THE MONTHS OF FEBRUARY, MAY, AUGUST, AND NOVEMBER

Publication office: 730 W. Monroe St., Chicago, Ill.
Editorial and General offices: University of Wisconsin, Sterling Hall, Madison, Wis.
The contents of the *Journal* are indexed in the *Industrial Arts Index*.

Entered as second-class matter, January 3, 1938, at the post-office at Madison, Wis., under the Act of March 3, 1879. Additional entry at Chicago, Illinois. Acceptance for mailing at special rate of postage provided for in section 1103, Act of October 3, 1917, authorized October 12, 1922. Printed in the United States of America.

Subscription Rates: $5 a year; $1.50 a copy. Remittances may be made by personal checks, drafts, post-office or express money orders payable to the Journal of Land & Public Utility Economics.

Agents of the *Journal* in Great Britain, B. F. Stevens & Brown, Ltd., 28-30 Little Russell St., British Museum, London, W. C. 1.

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Founded by RICHARD T. ELY

Published by The University of Wisconsin

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To *Journal* Readers and Subscribers:

The return of *The Journal* to Wisconsin, after seventeen years' publication from Chicago, has brought many thought-provoking comments from readers. Consideration was given to the suggestion that some of these evaluations of *The Journal* be published in this issue. But facts seemed sufficiently eloquent. The University of Wisconsin, in taking on this added responsibility at a time when defense programs are making heavy demands, is paying effective tribute to the efforts of those who have carried it thus far, and is giving recognition to it as a publication which has established merit.

The delay in publication date of this first issue from the University of Wisconsin has been kept at a minimum. The officials of Northwestern University have cooperated graciously during the interim period of moving of offices. Priority rulings added to the problem of the physical transfer of records, which was completed late in February. If you have not received prompt attention to your orders and communications recently, your indulgence is requested.

PLEASE NOTE. *Contributors of major articles to The Journal* will hereafter receive one hundred reprints of their article gratis. This constitutes a change in previous policy. *The Editorial Council,* now being completed, will be announced in the next issue. *The Editorial Office* is in Sterling Hall, University of Wisconsin, Madison, Wisconsin, and all communications should be addressed there. *Managing Editor.*

THE JOURNAL OF
LAND & PUBLIC UTILITY
ECONOMICS

FEBRUARY
1942

VOLUME XVIII
NUMBER 1

A Quarter Century of Land Economics

By CLARENCE A. DYKSTRA*

WITH the return of the *Journal of Land and Public Utility Economics* to the University of Wisconsin it is well to recall that this transfer marks exactly a quarter century of development in the field of land economics. It was in 1917 that Dr. Richard T. Ely published his paper "Landed Property as an Economic Concept and as a Field of Research," a significant title for the land economist because it emphasized the institutional aspect of the subject.[1] This does not mean, of course, that land had not been a subject for serious consideration before this; in fact it was almost central in the doctrines of the classical economists. Henry George merely carried their doctrines to a logical conclusion and the replies of his "classical" opponent were not altogether convincing. However, he did not recognize the trend already under way which would subordinate land to other forms of property in the economic world until today it has been called "the heritage of the underprivileged."

Another stream of interest in land economics arose out of the conservation movement. This interest can be found in the writings of scholars and scientists long before Theodore Roosevelt and Gifford Pinchot dramatized the cause in 1908. Frederick Jackson Turner called attention to the passing of the frontier and the coming "scarcity" of land. The creation of the federal forests, federal reclamation of arid lands in the same era marked a definite change in the American land policy. By 1908 the crusade for conservation was under way and shortly thereafter appeared President Van Hise's classic, *The Conservation of Our Natural Resources.* Economists were not asleep during this period and made their own contributions. Dr. L. C. Gray's two articles in 1913-14 and the Ely-Hess-Leith and Carver, *Foundations of National Prosperity,* are landmarks in the literature dealing with the economics of conservation.

Concurrently with these events other challenging problems arose. Prominent among them was the constantly growing proportion of tenant-operated farms, and a considerable body of literature had appeared in this field before the War of

* President, University of Wisconsin.

[1] *American Economic Review Supplement,* vol. VII, #7, March 1917.

1914-1919. During the war the emphasis shifted to land utilization and settlement and after the war the severe period of readjustment stimulated research in land classification, tax delinquency, zoning, the shifting of agricultural land into forests, grazing and other nonagricultural uses. Tax delinquency created a "new public domain" of publicly owned land on the margins between agriculture and grazing, farming and forests, and in the transition zone between urban and rural land uses. Public programs of resettlement, retirement of submarginal land, public land acquisition, soil conservation, tenant purchase and land-use planning have challenged the land economist in his teaching, research and administrative capacity.

By 1919 the interest in land economics had become crystallized enough so that a Division of Land Economics was organized in the Bureau of Agricultural Economics of the Department of Agriculture in Washington, with Dr. L. C. Gray in charge. Its early studies were concerned with the land boom in Iowa, farm credit as a means of helping farmers to become owners, and land settlement in the Lake States.[2]

Also in 1919 Dr. Richard T. Ely gave the first course in Land Economics under that name although he had taught various phases of the subject in other courses and seminars as far back as 1910. Shortly after that he organized the Institute for Research in Land Economics and Public Utilities and gradually built up a staff of research workers who also gave courses in these two fields at the University of Wisconsin. The third step was the founding of the *Journal* as an outlet for the publication of the research of the Institute as well as a vehicle for research and free expression of opinion and discussion of all those engaged or interested in the two fields represented by the *Journal.*

Meanwhile, another stream of interest in land economics flowed out of the fields of city planning and urban land economics. Reenforced by the unexampled expansion of cities, real estate developments and industrial growth of urban centers in the early 1920's, research and teaching in this phase of land economics developed. Many of the courses, books and publications in the applied aspects of urban land economics, financing, zoning, city and regional planning stem from this period. A course in urban land economics was offered at Wisconsin in 1922 and real estate courses were started two years later. After Dr. Ely moved to Northwestern University in 1925 the work in these two fields was greatly expanded.[3] Interest in this sector of land economics has continued to grow, with the problems that came out of the collapse of the "boom," that arose with the rapid "decentralization" of cities and the consequent drastic readjustment in land uses in the cities and the rural-urban fringe. The public's interest in this phase is indicated by such publications as "Our Cities" by the Urbanism Committee of the National Resources Planning Board and subsequent publications.

The above is a crude, inadequate sketch of the scope and content of land economics. Land economics covers not only the fields mentioned but also forests, recreational land, water resources and minerals. Public utilities, especially those concerned with transportation, water powers and those furnishing neces-

[2] L. C. Gray, "Evolution of the Land Program of the United States Department of Agriculture," an address before the Bureau of Agricultural Economics Conference on Land Planning, March 22, 1939.

[3] George S. Wehrwein, "Development and Present Scope of Land Economics," *Journal of Land and Public Utility Economics,* May 1927, p. 203-206.

sary services to land are integrated with land and its utilization. A survey of the articles published in the *Journal* during its 17 years of history will reveal that every one of these phases of land economics and public utilities has been represented in its pages. It was started under the able management of E. W. Morehouse and later the managing editor was Miss Helen Monchow under whose efficient guidance and administration the *Journal* has made an enviable reputation among well edited scientific publications. To them and to Northwestern University, who for so many years carried the burden of editing, managing and financing the *Journal,* we, who now assume these tasks, are deeply grateful.

A COMMUNICATION FROM DR. ELY

Dear *Journal* Editors:

The return of *The Journal of Land & Public Utility Economics* to the University of Wisconsin is, to me, very welcome and heartening news. It is coming home.

We all appreciate what was done for the *Journal* and for those of us who went to Northwestern University. We appreciate especially the fine services of Dr. Helen Monchow. In my opinion, *The Journal of Land & Public Utility Economics* has been one of the best written and best edited of all the economic journals. It has a unique field and this it has filled admirably.

Wisconsin is home. No other university in the country has done for land economics what Wisconsin has done and is doing. It also holds an enviable position in the field of public utilities. A splendid arrangement has been made for the editing of the *Journal,* enlisting not only the talent at Wisconsin, but the members of the Editorial Board and the Editorial Council are being selected from all parts of the nation.

I send my greetings and best wishes for the continued success of *The Journal of Land & Public Utility Economics* at Wisconsin. I shall be very glad to do all that is in my power to maintain its high standards. Keep up the good work! On, Wisconsin!

Faithfully yours,
RICHARD T. ELY

New York City

Patterns and Recent Trends of Chicago's Outlying Business Centers

By HAROLD M. MAYER*

THE outlying business centers are important features of the land use pattern of Chicago. They are unequalled in size, number, and importance by those of any other American city. The central business district is duplicated on a smaller scale at many places in the city by large commercial nucleations which perform, for the residents of the areas surrounding them, many of the functions which the Loop performs for Chicago in general. Decentralization of business has followed close on the heels of decentralization of population.

The pattern and structure of Chicago's outlying business centers very greatly resemble those of most large American metropolitan areas. Business localization in many cities has been affected by the impact of the automobile and by peripheral migration of the better residential areas with greatest purchasing power. While this study is limited to business subcenters within the city of Chicago, the methods of analysis, and some of the findings are applicable to almost every large city.

Relatively insignificant as late as 1910, the volume of business outside the central business district now greatly exceeds that within it. According to the 1935 Census of Business, the total sales volume in the central business district (the area bounded by Lake Michigan, the Chicago River, and Roosevelt Road) was $275,766,000, as compared with $785,487,000 in the remainder of the city.[1] Thus 74% of the total volume of Chicago retail sales in that year was outside the central business district.

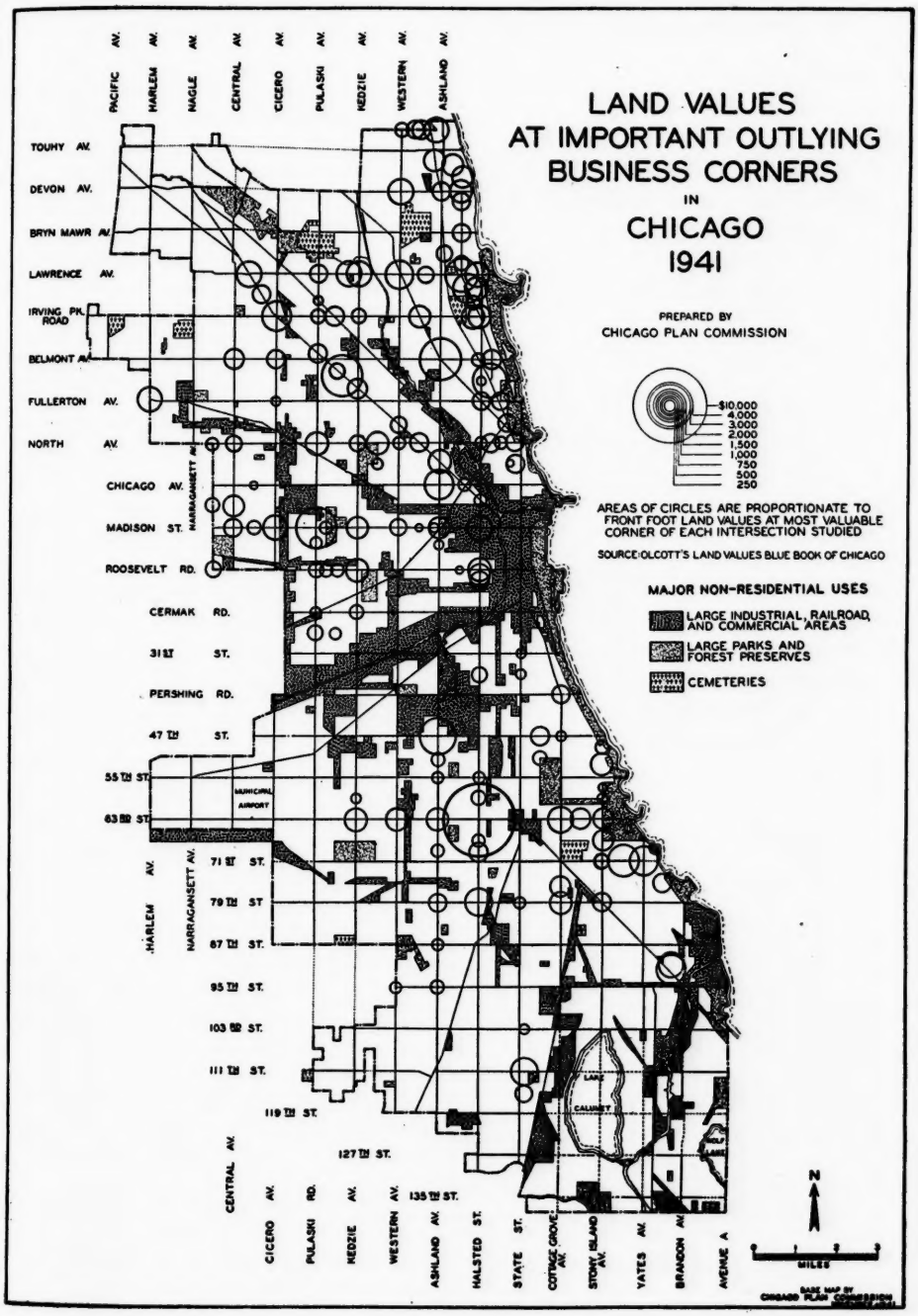
The residents of practically every part of Chicago are served by an outlying business subcenter in their neighborhood. Some of these, the major outlying business centers, have large department stores, theatres, banks, and many other types of retail, service, and amusement establishments. Others of lesser importance are nevertheless important in the daily lives of people in their immediate neighborhoods, for in them the housewives purchase their food supplies and daily necessities. Consideration of the number, location, size, and functions of these centers must precede the completion of a master plan of land use for Chicago.

The rectangular gridiron street pattern in Chicago has brought about a fairly regular spacing of the subcenters. There has always been a tendency for commercial land uses to locate along the mile-section-line and half-section streets which are the principal traffic arteries and which generally carry the street-car and bus lines. The intersections of such streets are attractive as sites for commercial development because traffic passes in four directions, usually with transfer between street-car or bus lines.[2] Where the few major diagonal streets intersect section-line corners, traffic passes in six directions and the tendency for growth of large subcenters is especially strong. The transfer corners are the cores of the business subcenters. The value of the most

* Research Planner, Chicago Plan Commission.

[1] U. S. Bureau of the Census, Census of Business, (1935) *Geographic Distribution of Retail Trade in Chicago, Illinois.*

[2] For further discussion of this, Cf. Hoyt, *One Hundred Years of Land Values in Chicago;* and Proudfoot, *The Major Outlying Business Centers of Chicago.*


LAND VALUES
AT IMPORTANT OUTLYING
BUSINESS CORNERS
IN
CHICAGO
1941
PREPARED BY
CHICAGO PLAN COMMISSION
$10,000
4,000
3,000
2,000
1,500
1,000
750
500
250
AREAS OF CIRCLES ARE PROPORTIONATE TO FRONT FOOT LAND VALUES AT MOST VALUABLE CORNER OF EACH INTERSECTION STUDIED
SOURCE: OLCOTT'S LAND VALUES BLUE BOOK OF CHICAGO
MAJOR NON-RESIDENTIAL USES
LARGE INDUSTRIAL, RAILROAD, AND COMMERCIAL AREAS
LARGE PARKS AND FOREST PRESERVES
CEMETERIES
PACIFIC AV.
HARLEM AV.
NAGLE AV.
CENTRAL AV.
CICERO AV.
PULASKI AV.
KEDZIE AV.
WESTERN AV.
ASHLAND AV.
TOUHY AV.
DEVON AV.
BRYN MAWR AV.
LAWRENCE AV.
IRVING PK. ROAD
BELMONT AV.
FULLERTON AV.
NORTH AV.
CHICAGO AV.
MADISON ST.
ROOSEVELT RD.
CERMAK RD.
31ST ST.
PERSHING RD.
47TH ST.
55TH ST.
63RD ST.
MUNICIPAL AIRPORT
71ST ST.
79TH ST.
87TH ST.
95TH ST.
103RD ST.
111TH ST.
119TH ST.
127TH ST.
135TH ST.
NARRAGANSETT AV.
HALSTED ST.
STATE ST.
COTTAGE GROVE AV.
STONY ISLAND AV.
YATES AV.
BRANDON AV.
AVENUE A
LAKE CALUMET
N
MILES

valuable corner in each of the subcenters may, therefore, be used as an index of the importance of the center in relation to others throughout the city.

The Major Centers

On the basis of the front foot land value of the most valuable corner,[3] the most important of the major outlying business nucleations of Chicago are grouped as follows:

A—CENTERS WITH MOST VALUABLE CORNER $2,000 OR MORE PER FRONT FOOT

1. 63rd—Halsted (Englewood)
2. Madison—Pulaski (Garfield)
3. Lincoln—Ashland—Belmont (North Center)
4. Milwaukee—Diversey (Logan Square)
5. Clark—Diversey (Lincoln Park)

B—CENTERS WITH MOST VALUABLE CORNER BETWEEN $1,500 AND $2,000 PER FRONT FOOT

6. Milwaukee—Irving Park—Cicero (Portage Park)
7. Commercial—92nd (South Chicago)
8. Chicago—Ashland
9. Ashland—47th (Packingtown)
10. Lawrence—Broadway (Uptown)
11. Jeffery—71st (South Shore)
12. Cottage Grove—63rd (Woodlawn)
13. Halsted—79th (Auburn Park)

C—CENTERS WITH MOST VALUABLE CORNER BETWEEN $1,000 AND $1,500 PER FRONT FOOT

14. Lawrence—Kimball (Albany Park)
15. Devon—Western (West Rogers Park)
16. Michigan—111th (Roseland)
17. Howard—Paulina (Rogers Park)
18. Lincoln—Lawrence—Western (Bowmanville)
19. Halsted—Roosevelt—Maxwell (Near West Side)
20. North—Pulaski (Humboldt Park)
21. Lake Park—53rd (Hyde Park)
22. Milwaukee—Lawrence (Jefferson Park)

[3] Land Values discussed in this paper are all from *Olcott's Land Values Blue Book of Chicago and Suburbs*, 1931 and 1941 editions.

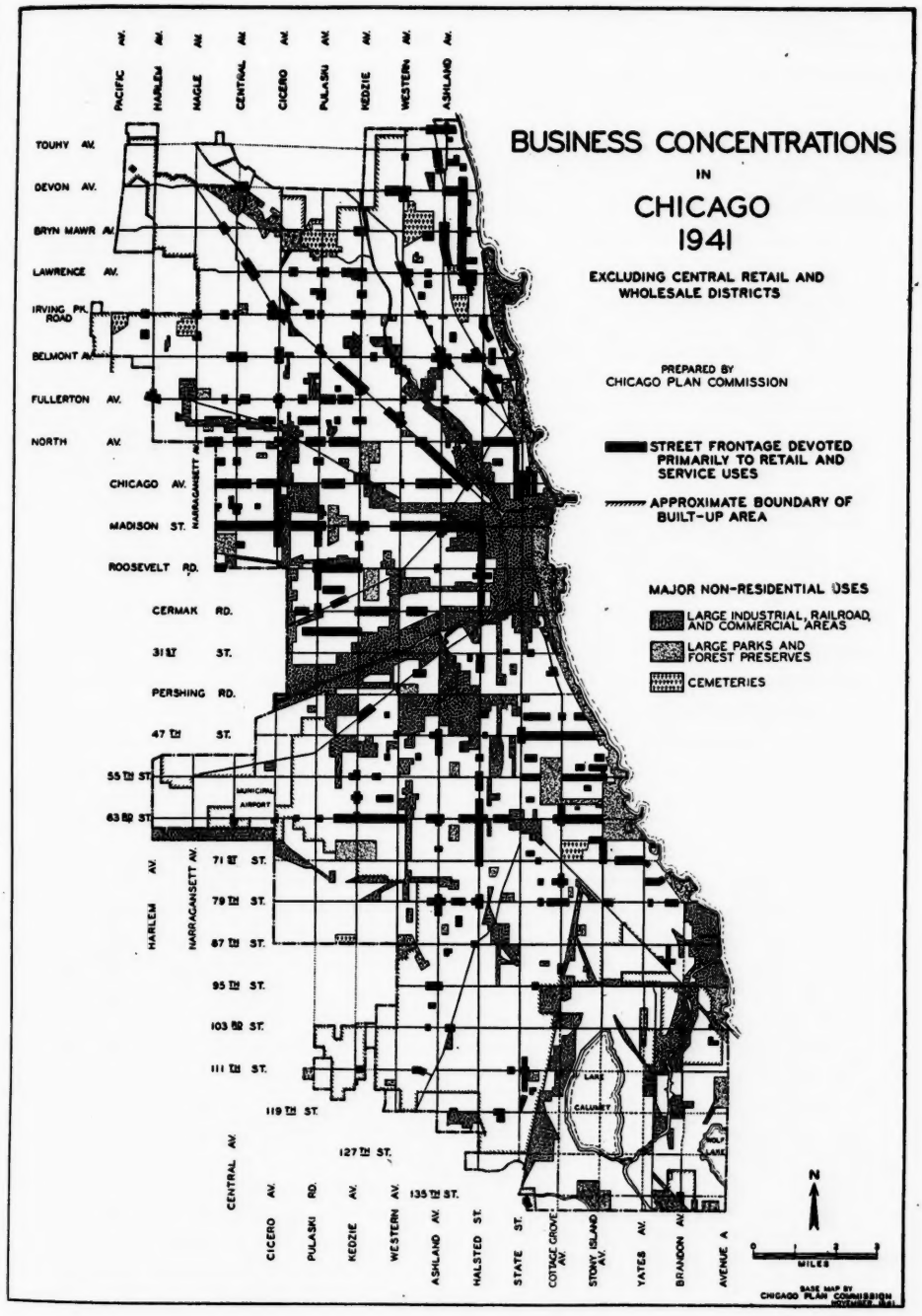
Stratification of Land Uses

Just as the city grows outward in concentric bands, so the important business nucleations grow outward from the intersections which form their cores. Competition for locations is most intense at the major corner, where the peak land value results; but outward from these corners along the major transportation axes there is also competition for locations, each kind of business seeking to get as near to the major corner as its rent-paying ability will allow. The result is a gradual decline in land values with increasing distance from the core intersection.[4] At the boundaries of the nucleations the values of the land approximate those of the long commercial ribbons which extend for miles along the major streets.

The Chicago Plan Commission has made a field investigation of the major commercial nucleations in the city outside of the central business district as its contribution toward the task now being undertaken by the city council in the rezoning of Chicago.[5] In the course of this investigation, which covered well over a million feet of business frontage, it was discovered that the business nucleations exhibit remarkably similar internal patterns of business land use. The outer boundaries of the nucleations were determined in the field, based upon the occurrence of features of business land use transitional between the intensive types such as department stores, furniture stores, and theatres, which serve large contributory areas, and the less intensive types, such as food stores, shoe repair shops, and other establishments

[4] This thesis was developed originally by Richard U. Ratcliff for Detroit, but the same situation exists in Chicago.

[5] The investigation was made by the author, with the collaboration of Matthew S. Rockwell, in its early stages.


BUSINESS CONCENTRATIONS
IN
CHICAGO
1941
EXCLUDING CENTRAL RETAIL AND WHOLESALE DISTRICTS
PREPARED BY CHICAGO PLAN COMMISSION
STREET FRONTAGE DEVOTED PRIMARILY TO RETAIL AND SERVICE USES
APPROXIMATE BOUNDARY OF BUILT-UP AREA
MAJOR NON-RESIDENTIAL USES
LARGE INDUSTRIAL, RAILROAD, AND COMMERCIAL AREAS
LARGE PARKS AND FOREST PRESERVES
CEMETERIES
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CHICAGO AV.
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103RD ST.
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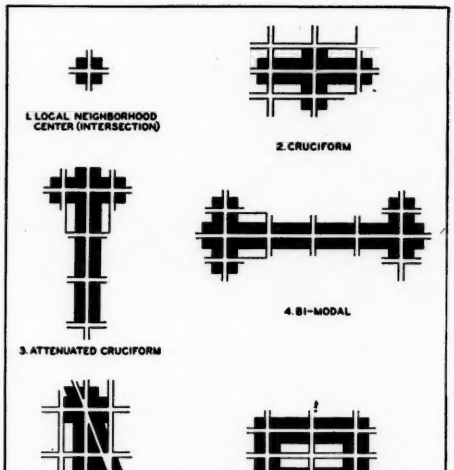
MUNICIPAL AIRPORT
HALSTED ST.
STATE ST.
COTTAGE GROVE AV.
STONY ISLAND AV.
YATES AV.
BRANDON AV.
AVENUE A
LAKE CALUMET
GOLF LINKS
N
0 1 2 3
MILES
BASE MAP BY CHICAGO PLAN COMMISSION NOVEMBER 1941

which serve only the daily needs of the population in their immediate vicinity. Generally speaking, boundaries were designated at points where a nucleated, well-defined intensive business development gives way to a more dispersed, less intensive ribbon development, to local neighborhood business use or to non-commercial land use such as railroads, institutions, industrial or residential areas, parks, or vacant land.[6]

The boundaries thus defined in the field were found generally to occur where the front foot land values, as shown by Olcott, fall to about $200. This relationship is not invariable, however, because other factors such as the direction of new growth, the orientation with respect to transportation, and relation to competing subcenters, are not always fully reflected in the land values. Furthermore, land values do not immediately react to changes in conditions affecting the business areas; there is usually a lag of a year or two.

Are i Patterns

When the business nucleations, thus bounded, are plotted and outlined on a large scale map, they are found to assume definite areal patterns. These patterns, or "ground plans," are controlled by the pattern of streets. The patterns may be classified as: (1) intersection, (2) cruciform, (3) attenuated or asymmetrical cruciform, (4) bi-modal, (5) cruciform modified by diagonal, and (6) quadrilateral. Examples of all types are found in Chicago. The first four may be regarded as stages in the development of typical nucleations and the latter two types of patterns are the results of special



PATTERNS OF BUSINESS NUCLEATIONS

types of street layouts. Typical evolution is as follows:

1. As new areas develop, stores supplying the needs of the residents come in at random but are usually located on the section or half-section streets and within easy walking distance of their customers. These stores are most commonly grocery and other food stores. Since the passage of the Chicago Zoning Ordinance in 1923, the stores have been prohibited on otherwise purely residential streets and have located along the major traffic arteries. If not at major intersections, they tend to be absorbed in the growing ribbons of commercial development which commonly extend for miles along the major streets. The recent tendency, however, is for locations to take place at major intersections, since accessibility by automobile is increasingly important in the areas of new growth on the edge of the city. An intersectional development

[6] The boundary criteria are very similar to those used by Proudfoot in his earlier study of Chicago's business subcenters. Cf. Proudfoot, Malcolm J., "The Outlying Business Centers of Chicago" in *Journal of Land and Public Utility Economics*, February, 1937, pp. 57-70.

may consist of a group of neighborhood food and service stores, or may originally consist of filling stations, the trade of which is derived from passing traffic. Commonly the two types of business uses are combined at the same intersection. Literally thousands of such nucleations exist in Chicago. In the older neighborhoods, apartments may be located over the stores.

2. As the intersectional nucleation grows it expands in all directions along the streets which form the intersection. The result is a cruciform pattern. At this stage, stratification of kinds of business use is evident. Intensive uses, such as drug stores, banks, and professional office buildings, occupy the four corners of the core intersections, with less and less intensive uses outward until, at the edges, the purely local neighborhood stores may be found. These intersectional cruciform centers are commonly spaced not closer than one mile from one another, because the section-line streets are so spaced, and the economic support is from a rather large population. Any sized nucleation may be of this type, though in the most important subcenters the forces of growth do not act equally in all directions and the areas of intensive business development tend to be asymmetrical.

3. The more powerful influences, such as population density, purchasing power, or traffic flow, very commonly are unevenly distributed with respect to a given nucleation, thus destroying the symmetry of the business area. A large department store or theater, located some distance from a core intersection but within the nucleation, may exert a powerful attraction for other business, resulting in an asymmetrical cruciform development. For example, the most important outlying business center in Chicago, Englewood, with nucleus at the intersection of 63rd and Halsted Streets, has developed a long extension southward in the direction of the major part of its contributory area. The establishment of a large motion picture theater at the eastern edge of the nucleation, in order to take advantage of the larger land area there available for development of a parking space, has resulted in recent growth of the nucleation in that direction.

4. In some cases the intensive types of business land uses characteristic of the major outlying centers extend along the section-line streets or diagonals between two important intersections with no significant break in land values or intensity of use. These are bi-modal or dumb-bell shaped centers with peak land values at two nuclei, and high land values on the connecting street as well. Examples of this type of development may be found on Milwaukee Avenue between Division Street and North Avenue, and on 63rd Street between Cottage Grove and Woodlawn Avenues.

5. In addition to the section-line and half-section streets most of the diagonal streets in Chicago are major traffic arteries with street-car lines. Where these streets cross the section-line intersections, traffic flows in six directions. Such situations are particularly favorable for the development of important business nucleations. The business center at the intersection of Lincoln Avenue with Belmont and Ashland Avenues is the largest and busiest outlying business center on the north side of the city and one of the very few in near-blighted areas which have increased in relative importance during the past decade. Very important business nucleations have also developed at Milwaukee, Irving Park, and Cicero Avenues, at Lincoln, Lawrence and Western Avenues, and at several other six-cornered major intersections, particularly on the north side.

Typically, the ground plan of such nucleations shows an elongated development on one arm of the diagonal.

6. A further development of the bimodal pattern may produce a quadrilateral, particularly where important parallel streets are relatively close together. In this type of development the business uses are located on the major streets forming a hollow square, with other than business uses on the inside. Peak land values are at the four corners of the quadrilateral. Because of the regular spacing of the major streets this type of development is rare in Chicago. The Uptown center, formed by Lawrence Avenue, Broadway, Wilson Avenue, and Sheridan Road, is the only major nucleation of this type in the city.

Analysis of the Cores

The cores of the business nucleations are, for the most part, anchored at the major intersections. The centripetal attraction of the intersections is sufficiently strong to overcome any tendency which the core of the nucleation may otherwise have to migrate, regardless of the trends in the centers which may affect the land use and values other than at the major corners. New nucleations grow while older ones may dry up, but shifting of the cores in the direction of new influences, such as population increases, is not common. Coalescence with the next center would result. In the case of 63rd Street in Woodlawn this has happened and, in spite of peak values at both Woodlawn and Cottage Grove Avenues, the half mile between is solidly developed with business. The western nucleus at Cottage Grove has suffered a very great decline in occupance and value as the purchasing power to the west has declined, yet the intersection of 63rd Street and Cottage Grove Avenue is still the most valuable corner.

Radial Extensions

Although the cores of the business subcenters are relatively stable, the tentacles of business which extend outward from them along the major streets are influenced by changes in the population and purchasing power of the contributory areas to a greater degree. The percentage changes in land values, block by block, in each direction away from the core as far as the boundaries of the nucleation are indicative of the tendency of the nucleation to shift. The symmetry may change and the tentacle in the direction of the major population increase may be relatively healthy while the one in the opposite direction may atrophy.

A tabulation[7] which shows the percentage declines in land values, block by block, has been made for each of the major nucleations. Study of this tabulation indicates that, although most of the business areas have not been affected to any significant degree on one side more than the others, a few exhibit a notable tendency to shift in one direction or another. In practically every case the movement is toward stable areas or areas of new growth, whereas those portions of the nucleations on the sides of the major intersections away from the areas of new growth are declining in value at a much greater rate.

Extent of Nucleation

In the city as a whole, there has been no general tendency toward either greater integration of the commercial nucleation around the major intersections which form their cores, or toward

[7] This tabulation, titled "Relative Changes in Land Values, 1931-1941, by Blocks, at Major Business Subcenters," is on file in the offices of the Chicago Plan Commission, and also in the library of *The Journal of Land and Public Utility Economics*. It is accessible for study by interested readers.

dispersion. The tabulation referred to above, shows the average decline in land values for the decade 1931-1941 for all commercial nucleations in the city which serve more than purely local neighborhood trade but excluding the central business district and its immediate vicinity. Only those areas are included which have been determined by field inspection to be within the limits of a nucleation, as evidenced by the character of the land use. The declines in land values have been calculated, block by block, away from the core intersection in each direction as far as the boundaries of the nucleations. The unit is the short block, 330 feet in length. Values are those given by Olcott for 1931 and 1941. Where they differ on the two sides of a street the average was used, unless the differences in value are over 100% and field investigation revealed marked contrasts in the intensity of business occupance on the two sides of the street. In such cases the land values on the side of the street more intensively used for business were included in the tabulation.

Changes in Land Values

Table I shows that the relative declines in land values at varying distances from the major corners of the nucleations have been independent of the size of the nucleations. Separate tabulations for each of three groupings of subcenters reveal similar relationships. A notable exception occurs in the three most important primary centers where the declines in land values have averaged greater with increasing distance from the core intersection.

This indicates that the very largest centers—Englewood or Southtown, Garfield, and North Center—have tended to concentrate to a greater degree than most. The result is a very high land value peak at the core of each—a peak which in these three cases has become relatively more important during the past decade.

Within the past few years, decentralization, as with the central business district, has occurred to some extent in the outlying subcenters. The newer large theaters, some department stores, and scores of "supermarkets" are now located on the fringes rather than in the cores of the nucleations. These represent very intensive commercial land uses of types, for the most part, that formerly sought locations as close as possible to the central intersections of each nucleation. Traffic congestion and lack of parking space have encouraged and stimulated this new trend. Accessibility formerly was greatest at the transfer corner. But the congestion there is a disadvantage as well as an advantage since common-carrier local transportation has become less important with increased use of the automobile. The centripetal attraction of the street-car and bus transfer corners is, in the larger subcenters, counterbalanced by the centrifugal attraction of the newer stores and theaters on the fringe, so located in order to take advantage of the greater availability of relatively less expensive land, much of which is set aside as parking space for the convenience of customers. In many subcenters even where the decentralization of business has not yet occurred, parking lots maintained by groups of cooperating establishments are located at or near the edges of the intensively developed area. The result in the near future may well be a decreasing importance of the core intersections and a more even distribution of land values in all parts of the nucleations. The boundaries, however, will probably remain as definite as heretofore.

TABLE I. PERCENTAGE DECLINES OF LAND VALUES OF BUSINESS SUBCENTERS WITH RELATION TO DISTANCE FROM HIGHEST VALUE CORNERS*
1931-1941

Distance from Highest value corner (unit = 330 ft.) (in blocks)	Average of the three Most Important Subcenters [a]		22 Sub-centers with Major corner valued $1000 or over per front foot in 1941		Average of 58 Subcenters in all parts of the city [b]	
	No. of blocks included	Average Decline	No. of blocks included	Average Decline	No. of blocks included	Average Decline
Most valuable corner	3	38.1%	28	54.2%	58	57.7%
1	14	54.6	103	63.5	188	64.7
2	14	61.9	75	64.4	120	64.2
3	6	70.6	37	65.6	61	65.8
4	6	72.6	24	62.0	39	64.8
5	4	65.4	11	62.5	19	61.2
6	2	72.8	7	64.6	11	64.3
7	2	67.1	6	64.2	9	65.9
8	2	72.1	3	72.6	6	71.3
9	1	58.3	2	62.7	3	64.5
10	1	62.5	2	66.6	2	66.6

* Source: Olcott's Land Values Blue Book of Chicago.
[a] The three most important business subcenters, on the basis of volume of sales as reported by the 1935 Census of Business, and confirmed by field inspection of land use intensity, are: Englewood or Southtown (63rd and Halsted) for the South Side; Garfield (Madison and Pulaski) for the West Side; and North Center (Lincoln, Ashland and Belmont) for the North Side.
[b] Subcenters listed earlier in this article.

Relation to Type of Residential Area

Surrounding the commercial core of the city are a number of roughly concentric crescents within each of which certain conditions and problems have been determined to be generally similar.[8] The business subcenters are not confined to any type of area thus defined but are found in all parts of the city. They share the problems of each of the areas which are contributory to them but, in addition, the outlying business centers as a group have many common characteristics and common problems.

As indicated in Table II, the greatest number of the outlying business centers are in the so-called conservation areas. These are the areas in which the greatest proportion of the population and purchasing power is concentrated. The major objective of planning for these areas is the conservation of existing economic and social values for as long a time as possible. The prosperity of the business centers in these areas is directly dependent to a large degree on the achievement of this objective.

The blighted and near-blighted areas are rapidly becoming depopulated. The result is that most of the business properties in these areas have suffered a decline in value far greater than that for the city as a whole. This, together with the importance of the nearby central business district, explains the small number of major commercial subcenters in the blighted and near-blighted areas. On the other hand, the peripheral areas of recent development in which the greatest population increases have occurred and the highest per capita purchasing power is concentrated have failed to develop im-

[8] The types of planning areas as defined by the Chicago Plan Commission are: slum and blight, near-blight, conservation, stable, arrested development, progressive development, and new growth. See also Robert C. Klove, "A Technique for Delimiting Chicago's Blighted Areas," *Journal of Land and Public Utility Economics*, November, 1941.

TABLE II. RELATIVE CHANGES IN LAND VALUES OF IMPORTANT OUTLYING BUSINESS CORNERS, 1931-1941

RELATIVE PERCENTAGE CHANGE (Average of all corners studied = zero)	NUMBER OF CORNERS BY TYPE OF RESIDENTIAL LAND-USE AREA						
	1 Blighted	2 Near-Blight	3 Conservation	4 Stable	5 Arrested	6 Progressive	7 New Growth
+90-100.0%			1				
+80-89.9							
+70-79.9			1	1			
+60-69.9			1				
+50-59.9			2		1		
+40-49.9			1	2			
+30-39.9			1	1			
+20-29.9	1	1	6				
+10-19.9	3	1	7	2			
+ 0- 9.9		1	14	3			
— 0- 9.9	2	2	24	3	1		
—10-19.9	3	6	17	2	1		1
—20-29.9	8	1	15				
—30-39.9	7		2				
—40-49.5	2						
Total	26	12	92	14	3	0	1

portant business subcenters. The influence of previously existing centers has been very powerful. The automobile has enabled the population of the areas near the edge of the city to reach easily the larger subcenters closer to the heart of the city. Then, too, the attraction of the larger suburban centers, particularly those of Oak Park and Evanston, has discouraged to some extent the development of major business centers in the adjacent parts of Chicago.

Relative Importance of Centers

Land values may be used as an index of the relative importance of the subcenters. They are not ideal for this purpose but represent the most easily handled and most readily available factor.

The value trend of a business corner is not a completely valid index of the relative changes in importance of the business subcenter of which it is the core, but, as demonstrated in this paper, the major corner tends to follow the same trend as all the other business property in the nucleation.

Table III shows the relative advance or decline in importance of many outlying business corners in all parts of the city. Included in the tabulation are all major outlying corners which had a land value of at least $1,000 per front foot in 1931.[9] The percentage deviation from the average decline for all corners studied is indicated. This eliminates the effect of the general decline in real estate values during the decade from 1931 to 1941, and enables relative changes to be studied. For example, a corner with a relative change of plus 40% decreased in absolute value, but only to the extent of 60% of the average of all the corners which were studied and tabulated. Therefore, relatively, it is 40% healthier than the average.

It will be observed that the median decline of land values of corners in the blighted areas for the period 1931-1941 was between 20 and 29.9% greater than the average decline of all corners tabu-

[9] Cf. complete tabulation titled "Relative Decline of Corner Land Values at Outlying Business Intersections Having a Value of at Least $1,000 per Front Foot in 1931, for the Decade 1931-1941," on file with Chicago Plan Commission.

TABLE III. LOCATION OF BUSINESS SUBCENTERS WITH RELATION TO RESIDENTIAL LAND USE TYPE AREAS

RESIDENTIAL TYPE AREA*	Number of Centers by Value of Most Valuable Corner, 1941				
	Total Sub-Centers	Over $2000	$1500-$2000	$1000-$1500	Under $1000 but over $1000 in 1931
1—Blighted Areas	17	0	1	2	14
2—Near-blighted Areas	13	1	2	1	9
3—Conservation Areas	89	4	5	5	75
4—Stable Areas	25	0	1	3	21
5—Arrested Areas	3	0	0	0	3
6—Progressive Areas	0	0	0	0	0
7—New Growth Areas	1	0	0	0	1

* Centers on the boundaries between two or more residential land use type areas have been included with the better of the two areas.

lated. The median decline of corners in the near-blighted areas was less; between 10% and 19.9% greater than the average, whereas in the conservation areas the decline was only zero to 9.9% greater than the average. The subcenters seem to be the healthiest in the stable areas, while those in the conservation areas are just about maintaining their relative position. The centers in the near-blighted and blighted areas, with but few exceptions, are declining in relative importance far more rapidly than those in other parts of the city. In general, a tendency is clearly evident for the business corners to decline in value relatively less as the character of their contributory residential areas improves.

The correlation between value of the business corners and the character of the areas in which they are located, however, is far from perfect. There is a considerable degree of divergence. The corners studied in the conservation areas, for example, varied from no decline to a decline of 30 to 39.9% in excess of the city average for all business corners studied.

This divergence is partially explained by special local conditions which operate in some of the business subcenters and partly by the fact that the subcenters draw patronage not only from areas in their immediate vicinities, but also from considerable distances. Business centers in conservation areas commonly draw from stable areas and areas of arrested development, as well as from areas of new growth. Some also draw patronage from blighted and near-blighted areas. The position of a given center in a conservation area relative to the better areas outward or the poorer areas inward toward the center of the city may in many cases be an important factor in the relative prosperity of the center.

Relation to Zoning

The Zoning Ordinance of 1923 has imposed upon Chicago—and actually encouraged—the development of a dispersed, almost haphazard distribution of business. Practically every section and many half-section streets are completely zoned for business far beyond any possible need for such use. The result has been a network of commercial ribbons with unprosperous small establishments located far from any contributory population of sufficient size to support them. Miles and miles of frontage zoned for business are vacant.

Lest the efforts of the framers of the Chicago Zoning Ordinance be unduly belittled, it must be remembered that

twenty years ago zoning was very new and nobody of experience had been acquired in that field. The spirit of the time was reflected in the belief that population and business activity could expand without limit. "Make no little plans" was the watchword. This was reflected in the zoning of Chicago. Since 1923, but few amendments (and these relatively insignificant) have affected the total of land zoned for business. In 1936 it was estimated that the land zoned for commercial use in Chicago was 28.41 square miles,[10] or approximately 6,564,000 square feet. This is equivalent to 1,250 miles of frontage. At the same time the amount of land actually used for commercial purposes in Chicago was 12.54 square miles, or about 500 miles of frontage. Thus only 40% of the land zoned for commercial purposes was actually so used.

A very considerable proportion of the business, particularly on the long ribbon developments, is submarginal as the result of a development of business establishments far beyond the potential purchasing of either the present population or of any population which may reasonably be expected in the future. The curve of population growth has flattened out. In areas now built up, very little if any increase in population can be reasonably expected. Zoning of residential areas in Chicago will henceforth be scaled to a much smaller population density than in the areas now intensively developed. A ceiling will be put on ultimate population, which may be easily estimated for the contributory area of existing and potential outlying business subcenters. Zoning for business beyond the supporting capacity of this population would result in an incomplete use of the land, and an abnormally dispersed business development outside of the major nucleations.

By far the greater part of the volume of business of the city is conducted in the nucleated developments. According to the 1935 Census of Business, in 7.2% of all the area zoned for commercial use, or 17% of the total frontage actually used for business, 44% of the total retail business outside of the central business district was conducted. This concentration would be even greater were it not for several specialized types of ribbon developments, particularly the "automobile rows" where the individual transactions represent very large dollar values.

It seems highly probable that the volume of retail business in Chicago could be at least doubled without the construction of any additional stores and without the absorption of any of the vacant land now zoned for commercial use. It seems quite evident that such a large increase in business cannot reasonably be expected in view of the slowing up of population growth. Obviously, the solution is to reduce drastically the areas zoned for business, at the same time preserving the zoning for commercial use in the vicinity of the commercial nucleations.

The war-time restrictions placed upon the use of the automobile will bring about a greatly increased use of street cars and buses. If this situation is prolonged, the relative importance of the transfer corners which are the cores of the nucleations will increase, and further concentration of business within each center will result. The recent tendency toward greater areal extension of the subcenters, as shown by peripheral location of newer theatres and supermarkets will be arrested.

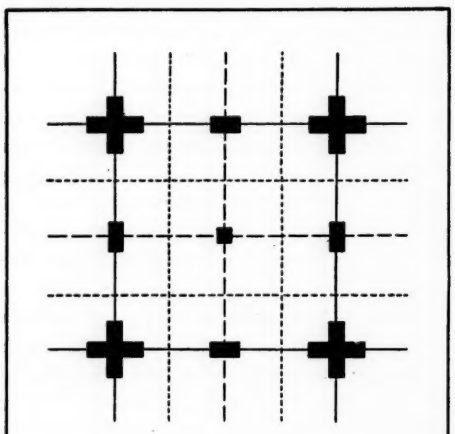
In Chicago, the fastest transportation all leads to the central business district,

[10] Hugh E. Young, "Some Practical Methods of Rezoning Urban Areas," in *Transactions* of the American Society of Civil Engineers, Vol. 104 (1939), pp. 904 ff.

and population increases will probably occur along these routes. This will favor a relative increase in the volume of business in the central business district as compared with the outlying centers.

Commercial Patterns of the Future

The commercial pattern in the future will bear an intimate relation to the neighborhoods which each nucleation will serve. Neighborhood units or "superblocks" will have local clusters of stores and service establishments with just enough frontage in commercial use to meet the needs of the local area. These clusters will be at or near the half-and quarter - section - line intersections, so spaced that no residential development will be more than one-quarter mile away from the nearest stores. In addition to these local neighborhood centers, larger nucleations will be encouraged by zoning for commercial use within a block or two of the major intersections. The section-line streets will be available for residential development free from the threat of invasion by incompatible commercial uses. Houses will face away from the main arteries of traffic so that access will be provided to the major streets only by local streets without direct access from abutting property. Thus through traffic will be confined to the major streets which will interconnect the main business nucleations. Abundant parking areas will be provided at the edges of the business subcenters, while transfer islands and separations from automobile traffic will facilitate transfer to and from street-car and bus lines in each large business area.



IDEALIZED PATTERN
SHOWING
LOCALIZATION OF BUSINESS IN A SQUARE MILE

Business subcenters in the future can be stabilized. The ceiling which will be put on population density in any given area will enable prediction to be made with some assurance of the population which may be reasonably expected in each of the neighborhoods of the city. Studies such as those of Bartholomew[11] point to the desirable optimum areas for efficient operation of business in relation to the contributory population. Future business centers can be planned and existing ones rebuilt, using the results of these and future similar studies. These centers will occupy only as much area as experience has demonstrated to be adequate to meet the needs of the communities to be served. In the planned rebuilding of Chicago's older areas, and in the zoning and subdivision of areas of future growth, the business subcenters will be integral, essential units in each neighborhood, scaled in size to meet the needs of the neighborhood. Estimates of the future population for each part of the city and study of optimum size of business for this anticipated population will be essential prerequisites of Chicago's master plan.

[11] Harland Bartholomew, "Urban Land Uses," Harvard University Press, 1932.

Integrating the Use of Irrigated and Grazing Land in the Northern Great Plains

By ROY E. HUFFMAN* AND JAMES L. PASCHAL**

THE three primary land uses of the West tend to be sharply divided—grazing, irrigated agriculture and "dry farming." Arable agriculture in the semi-arid parts of the Plains is especially subject to the vicissitudes of the weather cycle in contrast to the stable but less spectacular farming under the ditch. Grazing likewise can be precarious when dissociated sharply from the other land uses.

The integrated use of irrigated and grazing lands was early recognized as being highly desirable because it would lend stability to agriculture, especially in times of drought. Major John Wesley Powell, Director of the U. S. Geological Survey, outlined such an idea in great detail in his famous "Report on the Lands of the Arid Regions of the United States," in 1879. Powell recommended the organization of pasturage districts to be used in conjunction with irrigated land. Even at that early date, he saw the instability of a settlement pattern where one operator had all grass land with no adequate source of winter feed, while another operator had all river bottom land and no range land.

Powell warned the people of North Dakota regarding the limitations of the western portion of their state in an address to the North Dakota Constitutional Convention in Bismarck, August 5, 1889. Major Powell said, "The State of North Dakota has a curious position geographically in relation to agriculture. The eastern portion of the State has sufficient rainfall for agricultural purposes; the western part has insufficient rainfall, and the western portion is, practically wholly dependent on irrigation. In the western portion all dependence on rains will ultimately bring disaster to the people."

Time has proven the soundness of Powell's recommendations. A misguided land settlement policy of the federal government resulted in the settlement of a large part of the Northern Great Plains in relatively small tracts. Land-hungry people who failed to realize the limitations of semi-arid lands were encouraged by above normal precipitation to settle lands marginal for cropping and to attempt intensive agriculture on relatively small units. It soon became apparent, however, that a great deal of the land was not suited to crop production and that many operators had only a small percentage of the acreage necessary for an adequate livestock unit. Moreover, very few who acquired control of a sufficient acreage of farm land had access to a dependable source of winter feed.

Drought took its toll following the wet period and operators of large, as well as small units were forced out of business. Thousands of families left their units. Millions of dollars were spent by public agencies for various types of assistance.

The return of more favorable precipitation and prices relieved the situation somewhat, but the basic maladjustment was still left uncorrected. Many operators still are trying to farm land unsuited to cultivation. Their units are too small and they have little security against

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drought.

The nation has recognized the basic difficulty and is applying corrective measures. Development of the type of land use and settlement pattern envisioned by John Wesley Powell is now being undertaken in areas of the Northern Great Plains around new irrigation developments. A program of this nature was first made effective by an appropriation included in the Interior Department Bill for 1940, approved May 10, 1939, which authorized the construction of water conservation and utilization projects in the Great Plains. The legislation was based on the recommendations of the Northern Great Plains Committee of the National Resources Committee as reported October 14, 1938. The program has since been facilitated by the Wheeler-Case Act of August 11, 1939, and subsequent amendments.

The program is not only being used to provide new farms for low income operators in overcrowded areas, but also to correct basic difficulties and stabilize entire areas, both dry and irrigated, which may be influenced by the development of new irrigated land. Every effort is being made to extend the stabilizing influence of the irrigated land to as much dryland as possible. A project area is now thought of as including the surrounding dryland. The distance a project will extend into the area around the irrigated land will depend on the character of the surrounding country which will, in turn, determine the methods to be used in achieving integrated land use.

Methods of Achieving Integrated Land Use

The three most important methods by which the integrated use of irrigation and grazing may be achieved are as follows: (1) control and use of grazing land by operators living on irrigated farms; (2) control and use for feed production of small tracts of irrigated land by operators living on dryland units in the grazing area; (3) production of winter feed on irrigated farms for sale by dryland operators.

In most areas all three methods must be used, but the first is the most desirable. Large blocks of land suited primarily for grazing are adjacent to or near many of the projects now being developed. These lands should be used by operators of irrigated land. Their livestock can be pastured in the grazing area in the summer and wintered on the irrigated farms. Through the formation of a grazing association, operators of irrigated land may acquire control of a grazing area by purchase or long-time lease as it becomes available. Grazing areas are, for the most part, submarginal for crop production. In many instances, a great deal of the land is in public ownership and is unleased. This publicly-owned land, most of which is held by the county, may often form the nucleus of a grazing area.

Grazing areas are seldom entirely devoid of settlement, but because of improper land use and small units there is ordinarily a rapid turn-over in farm operators. The development of irrigated land offers new opportunity to low-income operators in overcrowded dryland areas.

Many of these operators may be resettled on irrigated lands and their dry farm units may be acquired by grazing associations. When practical, the ultimate goal should be the complete depopulation of grazing areas and resettlement of the dryland operators. The elimination of schools and roads in grazing areas generally will permit a reduction of taxes and make it more nearly possible to keep the land in grass. The concentration of farm families on irrigated

lands will increase the availability and quality of educational, recreational and health facilities and reduce the cost of transportation for social and business trips.

Grazing land controlled by an association will be in strong hands and therefore will not be affected materially by inflated land values which usually occur in the Great Plains with favorable precipitation or prices. The land will be kept in grass and not sold to individuals. The chaotic conditions sometimes caused by the competition of operators in overcrowded areas for individual tracts of land when weather conditions are favorable will be largely eliminated. Because of the stability obtained through integration with irrigated land and proper use, the land owners will be able to pay taxes regularly instead of losing their lands as is often the case now.

Since these areas are seldom devoid of settlement, dry farm operators must be considered when attempts are made to integrate the use of grazing and irrigated land. Experience has shown that chances for success are against the farmer over 50 years of age who settles a new irrigated farm. It has also been found that many operators over 50 are not interested in learning a new type of farming. For various reasons, some operators under 50 years of age do not care to change. Although many dryland operators may be resettled on irrigated land and the resources they occupied taken over by the grazing association, it is obvious that many others must be cared for in other ways.

The second method of achieving integrated land use may be applied for those operators who are not eligible for full time units on the irrigated land and cannot find opportunities elsewhere. When located near enough to the project to make it practical, operators remaining on dryland units may increase the stability of their operations by the use of a small tract of irrigated land on which to produce winter feed for their livestock. These tracts, which are without buildings, vary in size from 10 to 50 acres depending on the needs of the operators. In most cases these arrangements are likely to be of a temporary nature and should be terminated when the operator finds a better opportunity or retires. In either case the vacated dryland resources should be taken over by a grazing association. Certain precautionary measures might be taken in order to insure ultimate control by an association of the dryland resources occupied by operators who cannot be resettled immediately. It may be desirable for an association to purchase the occupied land whenever practical and lease it back to the operator as long as he personally continues to use it. The association would immediately start using the land when vacated by the present operator. It must be emphasized that the task of integrating the use of irrigated and grazing land is not an event but a process which will require many years to complete.

Since an association is dependent on the earnings of its individual members to pay operating costs and retire indebtedness, land purchases and leases must be made at rates which the land users can afford to pay. The association should determine the permissible rate and use it as a guide in purchasing or leasing land. The cost of grazing per animal-unit month is commonly used for this purpose. Experience has shown that, in many cases, the land costs are too high. Several methods of reducing these costs may be used. In some cases, the vendor has been willing to reduce his asking price. County officials are often

willing to reduce tax assessments when assured that taxes will be paid regularly and promptly. The removal of buildings and of other unneeded improvements and the reseeding of submarginal cropland also assist in obtaining lower tax assessments. Payments by the Agricultural Adjustment Administration for reseeding submarginal cropland may also be used to reduce costs.

The integrated use of irrigated and grazing land can eventually be achieved without causing undue hardship to anyone if an association stands ready at all times to purchase or lease all lands that meet the cost requirements and can be used efficiently. This will assist in adjusting submarginal areas to a basis on which they can be used profitably. The need for large amounts of public assistance at frequent intervals can be mostly eliminated.

The third and much less tangible phase of integration of the use of irrigated and grazing land is through the increased availability of adequate and cheaper livestock feed to dryland operators too far from the irrigation project for any type of direct combination between irrigated and dryland. The feed reserves on an irrigation project add stability to an extremely large area in this day of motor trucks and easy movement of feed supplies.

The first two methods of integrating the use of irrigated and grazing land are generally preferable to the third. The closer the integration can be made between irrigated and grazing land, the less likely it is to get out of balance during periods of drought and above average precipitation. Operators in the dryland area usually produce sufficient feed on their own units during periods of high precipitation and do not buy any feed from the operators on irrigated land. The operators of irrigated land are forced to grow other crops when their market for feed crops disappears. Because of this, dryland operators are often unable to buy sufficient feed crops from the irrigated land to feed their livestock through a drought. Therefore, it seems desirable to effect the closest possible integration between irrigated and grazing land, that is, between feed supplies and livestock.

In addition to areas which are primarily suited to grazing and which can be used by operators of irrigated land, there are communities which may be stabilized by the removal of some families and the proper disposition of land resources vacated by them. Careful selection of settlers for irrigation projects may do much to stabilize the agricultural economy of dryland areas and extend the benefits of the irrigation development. The benefits may be greatly increased through selection of families from overcrowded communities, areas consistently requiring large amounts of assistance, areas of improper land use, and isolated farms.

Land resources vacated by resettlement clients may be used to enlarge inadequate units of operators remaining in overcrowded dryland areas. For example, an eligible operator on a small unit may be interested in moving to an irrigation project. This operator may have a neighbor who is also situated on an inadequiate unit but is not eligible for resettlement or is not interested in moving to the project. A very worthwhile adjustment may be made if the second operator is aided in securing control of the farm vacated by the first operator. Many operators are forced to concentrate on risky one-crop wheat farming because of the inadequacy of their farm units. The combination of two or more farms make it possible to place more emphasis on livestock production because the poorer lands may be returned

to grass. It is important that the vacated resources be tied down through purchase or lease before the operator moves. If this is done, another operator may be prevented from moving on the inadequate unit.

The selection of operators from isolated areas may make possible the reduction of costs to the taxpayers for public services. The removal of one isolated operator may eliminate the need for several miles of road or make possible the closing of a school. In some instances, one family necessitates the operation of a school at great cost to the taxpayers. The blocking out of an area for grazing purposes may reduce township government costs and, in some instances, make possible the elimination of the township government.

An Example of Integrating Land Use

The development of the Buford-Trenton Irrigation Project in Western North Dakota is an example of some of the activities being carried on under the Water Conservation and Utilization Program.[1] When the project and adjustments are completed, it is planned that the use of approximately 100,000 acres of grazing land will be directly integrated with the use of 20,000 acres of irrigated land. New homes on irrigated land will be developed for 200 to 250 farm families who will come from dryland problem areas. The resettlement of these families is expected to make possible the enlargement to an adequate size of an equal number of farms which are now too small. A total of 400 to 500 low-income families will be rehabilitated and established on adequate, stable units, which should enable them to make their own way without public assistance .

The Buford-Trenton Irrigation Project lies between the main line of the Great Northern Railway and the Missouri River. The irrigable land of the project begins near the Montana-North Dakota State line and extends northeast to within about five miles of the town of Williston. The development plan contemplates that about 14,000 acres of river bottom land will be irrigated through canals supplied by means of a pumping plant at the west end of the project. In addition, there are about 6,000 acres of arable bench land between the canal now being constructed, and the railroad right-of-way. It is planned that this acreage will be irrigated at some future date by addition of a second pumping lift and another canal. Bench land, acquired in conjunction with land purchased under the main canal, will be available for irrigated-dry farming combination units until such time as the second lift may be installed.

A part of the plan for integrated land use includes the Buford-Trenton Grazing Area located in the southwestern corner of Williams County, North Dakota, and comprising approximately 65,000 acres. The irrigation project and the grazing area are contiguous for a distance of approximately fifteen miles. The area varies from a gently rolling topography in the north portion to rough breaks and valleys along the Missouri River. The major part of the grazing area is not classed as rough in topography but a sufficient number of valleys run through the area to provide ample protection for livestock in the spring and fall.

A preliminary investigation revealed that this had always been an acute problem area. Farming had been attempted but with little success. Farms were abandoned and families left the area. Tax delinquency, non-resident ownership and relief increased. Many things indicated that the area was badly in need of adjust-

[1] Often referred to as the Wheeler-Case Program.

ment and that it should be use primarily for grazing.

In order to verify this belief and to determine procedures which might be used in effecting adjustment of the area and integrating its use with the irrigated land, it was decided to assemble certain information in detail and map it in place. This information included land ownership, tax status, land use, operating units, location, condition, and adequacy of farmsteads; water supply, family composition, Farm Security Administration grant history, and livestock numbers by operators.

Availability of Land

County ownership of land and widespread tax delinquency is a good indication of distress in a given area. Types of land ownership in an area are a good indication as to the availability of land for sale or lease. Blocks of publicly-owned land, particularly county-owned land which do not lie within an area of definite land management, (national forests, grazing districts, etc.) usually indicate conditions favorable to the formation of a grazing association.

Just as ownership data are a good indicator of the availability of land as evidenced by the amount of publicly-owned land, so are tax status data a good indicator of the future availability of land as shown by the amount of tax delinquency. Land on which taxes are five years or more delinquent may be safely classified as potential county land.

Of the approximately 65,000 acres comprising the Buford-Trenton Grazing Area, 25,754 acres, or nearly 40 percent, was in public ownership in May, 1941. Williams County owned 15,092 acres of land not tied up under sales contracts and available for lease or sale. The federal government, state of North Dakota and Bank of North Dakota held the other publicly-owned lands.

Since the County Commissioners attempt to sell county-owned land as quickly as possible, this land was considered as available for purchase. In addition to the county-owned lands, another 21 percent of the area was five or more years tax delinquent indicating that it would probably be taken over by the county and sold. Including the county-owned land and land eligible for county ownership, approximately 46 percent of the area probably could be purchased. Approximately 15 percent of the area was three or four years' tax delinquent and it was possible that a great deal of this land would eventually be county land.

It was realized, however, that some of the county-owned lands might be sold to individuals and that individuals might redeem some of the tax delinquent lands on a sales contract basis. It is interesting to note, however, that taxes were paid up on only one-fifth of the area.

Resident individuals owned 42 percent of the area, but many of these owners were not residing upon their land and much of this land was unoperated. Corporate and non-resident owners held 18 percent of the area. It was quite probable that a large percentage of this land would be available for purchase.

After the detailed investigation of this area was completed, the federal government, acting for the Buford-Trenton Cooperative Association, purchased 14,413 acres of county land in this area. A meeting of the township boards in the area involved was held and this procedure was discussed. The boards requested the government not to purchase certain tracts which were desired by residents of the area. The government complied with this request. The county officials agreed to reduce the taxes on the acquired land to a level in keeping with

the productive capacity of the land. Steps are being taken to purchase additional land but no attempt will be made to acquire land owned or leased by present operators until they voluntarily vacate their holdings. Only land will be purchased on which costs are in keeping with rates the users can afford to pay. All available lands meeting the above mentioned condition will be acquired in the near future. Approximately 35,000 acres are being appraised at this writing. Of this amount it is estimated that 20,000 acres will be purchased within a year.

Land Use

The trend in land use is generally a reliable indication of the use to which the land is best adapted. A large part of the area is still in native sod and a great deal of the land which was plowed has been abandoned. Some land in the area is still being farmed, although it is submarginal for crop production, except in periods of more favorable precipitation and prices. There is one locality of good farming land comprising about 7,000 acres at the west of the area along the Montana-North Dakota State line. This land is not being included in the association grazing area.

Approximately 23 percent of the area was unleased and not included in organized operating units, according to Agricultural Adjustment Administration records. Eighty-nine percent of the uncontrolled land was in public ownership, most of which was held by Williams County. This acreage consisted of 93 percent pasture land, four percent crop land and three percent other land.

Operating Units

The Agricultural Adjustment Administration records showed 112 different individuals as operators of land within the Buford-Trenton Grazing Area. Many of these individuals were not bona fide farm operators. In many instances they were non-resident land owners who cooperated with the Agricultural Adjustment Program for the purpose of securing payments for restoration, deferred grazing, or other practices requiring very little expense on their part. There were only 22 operators residing within the boundaries of the proposed grazing area. In addition, there were a number of tracts of land in the area operated by bona fide farmers who had their headquarters outside of the area. Of the 22 resident operators, only three or four controlled a large enough acreage for a ranch unit, the type of agricultural economy that should prevail in the area. The operators of these larger units will probably remain in the area for some time. However, it is planned that the association will buy their holdings if they are offered for sale some time in the future. Operators of inadequate units are being encouraged to move to the irrigated lands and whenever possible their holdings will be acquired by the association.

Those who are not resettled on the irrigation project will be temporarily rehabilitated by the use of an irrigated feed base tract, but the association will attempt to acquire their land resources when the present operators leave their units.

The inadequacy of most of the units is indicated by the fact that they averaged only 861 acres, of which approximately one-third was cropland.[2] The average wheat base per unit was 102 acres. Since a few units had a much larger acreage

[2] Recommendations contained in the 1940 annual report of the County Extension Agent for Williams County set the minimum size of a ranching unit in the area at 1,920 acres of which 1,800 acres should be grazing land and 120 acres crop or hay land.

of pasture land than the average and a few units had a much larger acreage of cropland, it is obvious that a greater proportion of the operating units were small and that they had a very low acreage of cropland. Under normal conditions cropland in this area is not an asset to the operator.

Farmsteads

Condition and adequacy of farm buildings is usually a good indication of the prosperity of an agricultural area. In 1941 there were 55 sets of buildings in the proposed grazing area. A comparison of this inventory of buildings with the count of buildings made in the same area by the North Dakota State Highway Department in 1936 indicates rapid abandonment. Twenty-seven sets of buildings shown as occupied in 1936 were not occupied in 1941. Nine of these were vacant and 18 had disappeared completely. Eleven of the sets of buildings shown as vacant in 1936 were still vacant and the other three had disappeared.

Of the 55 sets of buildings in the area, in May, 1941, 35 were occupied and 20 were vacant. Nearly all of the vacant buildings were classified as poor and inadequate. Of the 35 occupied sets of buildings, 22 were occupied by bona fide resident farm operators, 7 by Indian families and 6 by other families. Approximately half of the occupied sets of buildings in the area were inadequate and in poor repair.

The unoccupied sets of buildings will be removed as soon as possible from farm lands acquired by the association. This will be done because the presence of unoccupied buildings in the area is likely to encourage the re-establishment of inadequate units. In most cases the new occupants of these buildings would be without funds and in the event they could obtain control of land it would probably be of poor quality and of insufficient acreage. The probable result would be a heavy relief load and the perpetuation of an unprofitable type of land use.

Age of Operators

In May, 1941, half of the resident operators of the area were 50 years of age or older. The high proportion of elderly operators may be associated directly with the period of homestead settlement when most of the operators came there as young men. Children of these operators, in most instances, left when they reached maturity because of the lack of opportunity. Since operators 51 years of age and over are usually ineligible for irrigated units, it appears that the best procedure is to assist them in their present locations. In order to insure the control of their units, the association at a later date may well afford to purchase the land occupied by these elderly operators and lease it back to them for the remainder of their lives. When the operator retires, the association would automatically start using the vacated land. All eligible operators 50 years of age and under are being encouraged to accept an irrigated unit. In addition to age, a number of other factors including character, health and managerial ability determine an operator's eligibility for resettlement. However, no operator will be approved for resettlement unless his dryland resources are used to effect an adjustment in the surrounding area through acquisition by the grazing association or as a means of enlarging an inadequate unit. Attempts are being made to assist ineligible or uninterested operators in obtaining opportunities elsewhere.

Public Assistance

Sixteen of the 22 resident operators in the grazing area have received Farm Security Administration grants in the amount of $11,426.00 or $1.13 for each acre of land which they operate. In addition to Farm Security Administration grants, some of these operators received Work Projects Administration earnings, public welfare assistance, surplus commodities, emergency Farm Security Administration loans and feed and seed loans from the Farm Credit Administration. Many of these operators also receive Agricultural Adjustment Administration payments.

The public assistance which has gone into this area probably would be sufficient to buy the entire 65,000 acres. By properly adjusting the use of this area, relief costs will be greatly reduced and the present operators given an opportunity to become self-supporting. The use of this area by the association for grazing purposes will prevent uninformed or economically desperate operators from resettling the land and developing a type of agriculture not suited to the area.

Other Factors

The area is well adapted to the production of livestock. It has an adequate water supply and will provide summer grazing for 2,000 animal units. Only 695 animal units were being grazed in the area in 1941. It is planned that the grazing resources of the area will be used to provide flexibility in the size of business on irrigated units. Grazing rights will not be allocated permanently to any operator or irrigated unit. The grazing rights will be distributed in such a way as to best serve the needs and desires of the operators. One operator may wish to relinquish certain grazing rights and to reduce the size of his operations as his children leave home. Another operator may need to increase his scale of operations to take care of a growing family. This operator would be allocated grazing rights that might be available. The grazing resources will also provide flexibility in the size of irrigated units which, as they are brought into full production, may prove to be more or less productive than was evidenced in an undeveloped condition.

No schools were operating in the area for the 1940-1941 school term. School facilities were supplied by four schools operating outside the boundaries of the area. The demand for other public services was equally light. The road from Buford north to U. S. Highway Number 2 is the only road within the area on which expensive construction work has been made. This road has been elevated and a portion of it gravelled. The better cropland is west of this road and there are some fairly good graded roads extending to the west. In the larger portion of the grazing area, the roads are poorly improved or are merely trails.

Summary

The nation was warned more than sixty years ago by Major John Wesley Powell regarding the agricultural limitations of the Great Plains. This warning went unheeded and the type of agriculture attempted has proven to be generally unadapted to the area. Inadequate units, risky one-crop farming, and uncertain precipitation have contributed to the development of an unstable agricultural economy. The resulting financial losses and human privations have given rise to problems which can be permanently solved only by a long-time plan to adjust the human and natural resources of the Great Plains to meet pre-

vailing conditions. The Water Conservation and Utilization Program, widely known as the Wheeler-Case Program, offers a means for achieving a more stable agriculture under the semi-arid conditions of the Great Plains. Integration of the use of irrigated and grazing land can make possible the stabilization of a large area through: (1) control and use of grazing land by operators living on irrigated farms; (2) control and use for feed production of small tracts of irrigated land by operators living on dryland units in the grazing area; and (3) production of winter feed on irrigated farms for sale to dryland operators.

The process of integrating the use of irrigated and grazing land is being carried out in connection with the Buford-Trenton Irrigation Project in Williams County, North Dakota now being constructed under the authorization of the Water Conservation and Utilization Program. Adjacent to and immediately north of the irrigated land lies an adjustment area of approximately 65,000 acres. The original settlement was relatively dense and numerous attempts were made at crop farming. Experience has shown that the area is not suited to crop production and intensive agriculture. A great deal of abandonment has occurred, cropland is returning to grass and large acreages of land are uncontrolled. Tax delinquency is a serious problem and expenditures for public assistance have been heavy. Relatively few operators remain in the area and a great many of these are elderly. Most of the operating units are too small, and the farmsteads are inadequate and in poor condition.

It is planned that nearly all of this adjustment area eventually will be used for grazing by an association of operators living on irrigated land. More than 14,000 acres of this land has been purchased for the association and it is planned to purchase 20,000 additional acres during the present year. This additional land will be purchased as it becomes available. Land in organized operating units or land priced too high is not being purchased. Buildings will be removed and plowed land acquired by the association will be reseeded to grass.

Eligible operators are being encouraged to resettle on irrigated units. They are not approved for an irrigated unit unless their dryland resources are made available to the association or to another dryland operator with an inadequate unit. Operators ineligible for irrigated units are being encouraged and assisted to relocate outside the grazing area but care is being taken not to force them out.

Operators who are ineligible for irrigated units and do not leave the area will be cared for in the best manner possible. They may be allocated irrigated tracts on which to produce winter feed for livestock. They may also be allocated grazing privileges in the area. Both the feed base units and the grazing privileges will be withdrawn when the present operator leaves the unit. At that time, the association will attempt to acquire the vacated resources. It is expected that the association will soon adopt a policy of buying occupied dryland units whenever possible and making a lifetime lease to the operator. This will be done to insure complete and permanent adjustment of the area.

The data presented in connection with the Buford-Trenton grazing area give some indication of the opportunities existing in the Great Plains for integrating the use of irrigated and grazing land in connection with the Water Conservation and Utilization Program. The Buford-Trenton grazing area is not an isolated instance but rather is typical of

the possibilities to be found. Many dryland operators are not "livestock minded" and are not interested in any tract of land that does not have a wheat base established under the Agricultural Adjustment Administration program. This has resulted in non-crop areas being largely unleased although the grazing land is often utilized without legal control. In some localities, such areas have all the aspects of the original open range with the exception that the land has passed from public domain to county ownership.

The changing fortunes of agriculture in the Great Plains present a problem to the successful completion of a comprehensive adjustment program. Operators located in areas experiencing a favorable crop year or two tend to become unduly optimistic. Every effort should be made to prevent unwarranted optimism during periods of above average precipitation and rising prices from defeating the long-time objectives of a program designed to better equip Great Plains agriculture to survive unfavorable periods.

Interest Rates in the Managed Economy

By MELCHIOR PALYI*

The Problem

RECORD low interest rates for a period approximating a decade, and the prospect of their further continuation for an indefinite length of time, raise theoretical and practical problems of great significance. The objective of the following is to analyze, with special reference to the American scene, one or two outstanding aspects of these recent developments. Our concern is especially with the factors which have brought about the downward trend of interest rates, and with some financial implications of a continued "bullish" bond market. The approach is restricted to problems of the "pure" interest rate: the net yield on so-called tax-exempt long-term bonds which do not imply a price for "credit-risk." The manifold social and economic consequences of Cheap Money can barely be touched upon, to say nothing about political implications. Nor is it the purpose of the present article to discuss the imposing number of recent interest rate theories, or their relevance to monetary, banking, fiscal and business cycle policies.

The essential facts are well known. The average yield of (partially tax-exempt) United States government bonds not due nor callable for twelve years, has fallen from the "inflation"-time height of 5.67 in August, 1920, to the pre-depression low of 3.17 in December, 1927, and fluctuated during the prosperity era between 3.17 and 3.74 (March, 1929). It rose in the great crisis reaching a peak of 4.26 in January, 1932. After a substantial but short-lived decline, it rose again to 3.53 percent in December, 1933, when the decisive turning point came. From that date on, the rate declined with only a few minor interruptions, beating one low record after another. The lowest level registered recently was 1.82% (daily average) early in November, 1941. Since then the rate has fluctuated closer to 1.9%, rising as high as 2.01% toward the middle of December, 1941, under the impact of America's entrance into the war. All medium and long-term rates have more or less closely followed the "pure" rate. (Cf. Table I.) A spectacular and almost continuous decline of the entire rate structure dominated so far the trend of the American credit market under the New Deal regime.

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Cheap Money on an International Scale

Two obvious explanations along conventional lines present themselves at once to the observer. One is the traditional theory that *high* bond prices are the logical counterpart of *low* stock values, both being part and parcel of the depression phase of the business cycle. This would explain the prevailing Cheap Money situation in terms of the previous century's cyclical experience, implying that an upturn would cause in the future, as it did in the past, a reversal of the present price trends on the security markets. The second theory emphasizes the mounting gold volume in the United States as the decisive agent acting behind the scene. This school of thought relies, too, on conventional theorizing based on the experience of the past. It argues that the vast and continued influx of gold, whatever its causes, expanded the credit base, especially the excess reserves of member banks, in addition to directly inflating the deposit volume. It permitted

TABLE I. AVERAGE YIELDS OF LONG-TERM TREASURY AND CORPORATE BONDS*

Date	Partially tax-exempt Treasury bonds [a]	Taxable Treasury bonds [b]	High-grade bonds [c]	Date	Partially tax-exempt Treasury bonds [a]	Taxable Treasury bonds [b]	High-grade bonds [c]	Date	Partially tax-exempt Treasury bonds [a]	Taxable Treasury bonds [b]	High-grade bonds [c]
					Monthly Series						
1933—Jan.	3.22	—	4.28	1936—Jan.	2.80	—	3.32	1939—Jan.	2.47	—	2.96
Feb.	3.31	—	4.34	Feb.	2.77	—	3.26	Feb.	2.44	—	2.90
Mar.	3.42	—	4.56	Mar.	2.71	—	3.24	Mar.	2.34	—	2.87
Apr.	3.42	—	4.63	Apr.	2.68	—	3.24	Apr.	2.30	—	2.92
May	3.30	—	4.48	May	2.66	—	3.22	May	2.17	—	2.86
June	3.21	—	4.34	June	2.66	—	3.19	June	2.13	—	2.78
July	3.20	—	4.28	July	2.65	—	3.18	July	2.16	—	2.76
Aug.	3.21	—	4.23	Aug.	2.61	—	3.18	Aug.	2.21	—	2.79
Sept.	3.19	—	4.28	Sept.	2.60	—	3.15	Sept.	2.65	—	3.29
Oct.	3.22	—	4.26	Oct.	2.62	—	3.14	Oct.	2.60	—	3.14
Nov.	3.46	—	4.45	Nov.	2.53	—	3.11	Nov.	2.46	—	2.93
Dec.	3.53	—	4.40	Dec.	2.51	—	3.07	Dec.	2.35	—	2.86
1934—Jan.	3.50	—	4.26	1937—Jan.	2.47	—	3.09	1940—Jan.	2.30	—	2.81
Feb.	3.32	—	4.14	Feb.	2.46	—	3.24	Feb.	2.32	—	2.79
Mar.	3.20	—	4.07	Mar.	2.60	—	3.36	Mar.	2.25	—	2.77
Apr.	3.11	—	4.00	Apr.	2.80	—	3.43	Apr.	2.25	—	2.74
May	3.02	—	3.94	May	2.76	—	3.36	May	2.38	—	2.87
June	2.98	—	3.88	June	2.76	—	3.31	June	2.39	—	2.93
July	2.92	—	3.83	July	2.72	—	3.27	July	2.28	—	2.85
Aug.	3.03	—	3.87	Aug.	2.72	—	3.25	Aug.	2.25	—	2.80
Sept.	3.20	—	3.89	Sept.	2.77	—	3.26	Sept.	2.18	—	2.71
Oct.	3.10	—	3.84	Oct.	2.76	—	3.26	Oct.	2.10	—	2.70
Nov.	3.07	—	3.78	Nov.	2.71	—	3.22	Nov.	1.97	—	2.65
Dec.	3.01	—	3.68	Dec.	2.67	—	3.17	Dec.	1.89	—	2.59
1935—Jan.	2.88	—	3.60	1938—Jan.	2.65	—	3.17	1941—Jan.	1.99	—	2.57
Feb.	2.79	—	3.52	Feb.	2.64	—	3.15	Feb.	2.10	—	2.71
Mar.	2.77	—	3.49	Mar.	2.64	—	3.16	Mar.	2.01	—	2.73
Apr.	2.74	—	3.47	Apr.	2.62	—	3.25	Apr.	1.96	—	2.76
May	2.72	—	3.48	May	2.51	—	3.14	May	1.92	—	2.75
June	2.72	—	3.43	June	2.52	—	3.15	June	1.91	—	2.70
July	2.69	—	3.35	July	2.52	—	3.12	July	1.90	—	2.66
Aug.	2.76	—	3.44	Aug.	2.51	—	3.10	Aug.	1.94	—	2.65
Sept.	2.85	—	3.47	Sept.	2.58	—	3.12	Sept.	1.94	—	2.64
Oct.	2.85	—	3.46	Oct.	2.48	—	3.06	Oct.	1.88	2.23	2.61
Nov.	2.83	—	3.41	Nov.	2.50	—	3.04	Nov.	1.85	2.22	2.57
Dec.	2.83	—	3.39	Dec.	2.49	—	3.02				

* Source: Bulletin of the Treasury Department, December, 1941

[a] Average of partially tax-exempt Treasury bonds neither due nor callable for twelve years. Partially tax-exempt bonds are those the interest on which is exempt from the normal rates of the Federal income tax.

[b] Average of taxable Treasury bonds neither due nor callable for twelve years. Taxable bonds are those the interest on which is subject to both the normal and surtax rates of the Federal income tax. This average commenced October 20, 1941.

[c] Average of 9 bonds, January 6, 1933, through December 6, 1935; average of 15 bonds, December 7, 1935, through July 31, 1937; average of 20 bonds, August 1, 1937, through September 13, 1938; average of 5 bonds, September 14, 1938, to date.

therefore a far more than proportionate expansion of "loans and investments" at the banks. Since under the cyclical conditions prevailing in the 1930's commercial demand for bank credit largely evaporated, the banks were (and still are) compelled to seek earning assets in the bond market, and preferably in government bonds.

These two theses are, or can be, used as mutually supporting each other. Indeed, the combination of the two seems to provide a complete and well integrated explanation of the rising trend of bond prices since 1933. True, in previous American cycles depressions were often periods of gold outflow. But this was due (in the 19th century) to the fact that the importation of foreign capital sagged at times of adverse business conditions in this country, a circumstance that has been modified or reversed through the change of the United States' international position from a debtor to a creditor nation.

At any rate, the inflated gold supply and the deflated commercial credit demand seem to explain naturally the rising demand for, and price of, government bonds.

Granted that both factors—cyclical depression and gold influx—have been instrumental in bringing about or promoting the Cheap Money development, at least in its earlier stages. The decline of bank loans in particular, freeing bank resources for investment, has been the immediate outcome of the 1929-1932 crisis. From late 1930 to the beginning of the second world war, this liquidation process reduced the loan portfolio of all banks. Similarly, the vast gold influx was at least in part independent of American financial and other governmental policies. High taxes and war signals in Europe and the Far East would have driven gold toward the United States even if the latter had not undertaken anything else but to accept it. However, from the very outset of the Cheap Money era (beginning with 1934) powerful political forces have been at work on the home front to lower the interest rate level. More recently, interferences on the part of public authorities in the same direction have become so numerous and effective as to virtually eliminate even the appearance of a "normal" or "natural" mechanism determining the price of credit.

A most impressive indication of the "managed" character of the Cheap Money trend in recent years is provided by an international comparison of interest rate developments during the last decade. Cheap Money, as a matter of *trend* rather than of *level,* prevails virtually in every country, and is apparently independent of cyclical conditions, gold movements, or other "natural" forces. Disregarding minor fluctuations, due mostly to adverse war expectations, the pure rate fell in England not only during the depression after 1931-1932, but also during the very substantial boom—including a housing boom supported by cheap real estate credit—in the years 1933-1937. No tightening of the money market, typical of an upturn in a nonmanaged economy, occurred. Similarly, Nazi Germany reached the full employment stage without any sign of a strain on the credit system. Falling interest rates coincided with gold influx in the United States and Switzerland, temporarily also in Holland and in Britain, but with gold outflow, or at any rate with a precarious gold position, in Germany, Japan, and in central European countries. War and war threats have raised the rates for a while, but they recovered toward the previously reached low levels, or even below, once the war got under way.

Another symptom to indicate that this world-wide trend of declining interest rates needs an explanation beyond the conventional supply-demand approach is the fact that it coincides with vastly rising national debts. Especially during the present war, and contrary to the development of the interest rate during the war of 1914, the rates are falling while the volume of national debts, and therefore the total supply of debt certificates on the respective markets, is rising by leaps and bounds. Long-term credit instruments of the diverse governments appreciate as their outstanding supply grows, contrary to all expectations based on old-fashioned supply-demand considerations. It seems to make little or no difference whether the countries are at war or peace; whether they belong politically in the democratic or totalitarian sphere, etc. It is, however, a permissible generalization that, especially since 1936, countries are *comparatively* the more "progressive"

in lowering and stabilizing interest rates the more their national debt tends to increase. Gilt-edged bonds are quoted (early 1942) at or near all-time highs in all parts of the British Empire—with South Africa— the only Dominion on a balanced budget, lagging behind the rest —in Germany, Japan, and Italy. In neutral countries with moderate deficits like Sweden and Switzerland on the other hand, the break of bond prices that occurred in 1940 has not yet been fully offset eighteen months later, and the fall of interest rates proceeds slower than in the belligerents. All this contrasts sharply with virtually every experience of the past.

Historical Parallels

Correlation between a large and growing national debt on the one hand and a declining or stabilized interest rate on the other has been observed before. Most of the European inflations during and immediately after the first World War were operated with the aid of a fixed bank rate, maintaining a similarly fixed yield on the vastly rising volume of governmental debt certificates. However, the rate was fixed in virtually every case at a level above, not below, the one that prevailed previously to the inflation experiment. And the analogy with the present situation is also defective for other reasons. In the present post-depression period,—and this again holds for virtually every country with the exception of France,—only a small fraction of the national debt is placed (so far) in the portfolios of central banks. The "open market" absorbs the bulk of the new debt, disregarding a substantial part shifted to governmental funds and other involuntary buyers. In the war period after 1914, a major part if not the whole of the debt was loaded upon the central banks, deluding the credit bases as the debt increased. The pure rate was then determined by pure fiat; the political authority regulated at will the rate to be paid to itself. (Central bank profits find their way into the treasuries of most countries.) At present, supply of and demand for funds still seem to determine the price of credit, leaving open the vital question: What in turn determines the demand schedule and the supply volume of the capital markets?

Another apparent parallel to the present Cheap Money system has been provided by France before 1914. Between 1874 and 1914, France's national debt approximately doubled. This was the outcome of a budget balanced only intermittently, with deficits arising from an unplanned surplus of non-productive expenditures over current revenues. During most of that period (especially since 1879) the yield of the country's leading popular investment securities, the long-term and perpetual *rents,* was held close to three percent. Fluctuations were limited within a narrow range, compared to those of the British consols or of German federal and state obligations. The Bank of France discount rate was kept similarly stable, with no more than one or two changes a year over several decades, as against six or more average annual changes of the Bank of England's official discount.

How was this comparative stabilization accomplished under a system of automatic gold standard, close "cooperation" (interest arbitrage) between international money markets, and on a seemingly unregulated internal capital market? It was done by a monetary management which created and utilized numerous loopholes in an unregimented monetary system. Gold outflow was minimized time and again, by discouraging the gold exporter either through the

threat of retaliation by the central bank, or by offering silver five-franc pieces, which remained legal tender after the abolition of the double standard, instead of gold, thereby stretching the discrepancy between the upper and lower *gold points*. More important was the control of the Paris *bourse;* new issues could be admitted only with governmental consent, permitting at least occasional market manipulations in favor of the government's obligations. Their market grew automatically with the rise of deposit in the municipal *caisses d'épargne* and in other savings institutions under legal compulsion to invest in government paper. But the decisive factors which permitted a substantial measure of interest rate stabilization were the savings' habits of the French and the comparatively slow industrial growth of France since 1870. So long as the public debt grew at a much lesser rate than the additions to the public's "liquid" savings—in a country with fairly stable gold reserves and with a slowly rising volume of circulating media, including bank deposits—the *rentier* retained the bonds "permanently." A reasonably remunerative yield was instrumental in maintaining the investor's habit to keep the once acquired securities from the market. This habit was very helpful in maintaining stability of bond prices in the face of cyclical and other changes in market conditions. The impact of such changes was minimized, in addition, by the comparative cycle-immunity of French economy, due to the prevalence of small-scale units in agriculture and industry, and to gradually increasing subsidies and tariff protection against international price fluctuations.

Management of the Capital Market

The Cheap Money system of the present era represents a substantially new departure in economic engineering, different from analogous developments of the past in scale of application as well as in the technique of management and in many of the underlying conditions. As a matter of fact, it is part and parcel of a process, little explored so far, which has already revolutionized the structure of the capital market, and which tends to bring about a credit system fundamentally different from any of the past. A survey of the new managerial technique in particular is apt to throw light on both the basic changes in the credit structure and the potential trends of further development. The method of interest rate manipulation subservient to the Cheap Money policy of this country has to do with direct or indirect interference either on the demand or on the supply side of the credit market, or on both.

A. To begin with the supply of funds, a first objective of Cheap Money management is to provide the market so as to avoid a disproportion between the rising demand for and the available volume of liquid funds. The problem arose in the crisis of 1931-1933, in the face of the hoarding and exportation of gold, internal and external runs on the banking system. In the United States, the problem of preserving and bolstering the monetary volume was attacked by the following devices: (a) temporary foreign exchange regulations, abandoned in 1934; (b) suspension of the conversion of legal tender into gold coin for internal circulation; (c) prohibition of gold ownership and compulsion to deliver gold to the Treasury; (d) gold purchases on foreign markets at a rising dollar price, culminating in the 40% devaluation in 1934; (e) liberalization of Federal Reserve credit policies, especially by liberalizing, in the Banking Act of 1935, the eligibility rules for rediscount; (f) legal

provisions to create fiat money, including the non-applied Thomas Amendment and the silver purchase act, the latter applied since 1934 in a continuous fashion; (g) legal provisions permitting the expansion of the credit base by the Federal Reserve System (open market operations and manipulation of reserve requirements for member banks).

These measures represented the opening up of actual and potential additions to the credit base, with the expectation of stopping the monetary panic and permitting currency expansion to foster an upturn. Devaluation had the additional effect of stimulating gold imports on an unprecedented scale, and bringing about a vastly greater expansion of the currency's gold foundation than had been expected by the advocates of that policy.

B. The next step, after having "led the horse to the water," was to "make him drink," i.e., to make actual use of the new possibilities of monetary expansion. The methods applied, consciously or otherwise, to attract capital into the government bond market, may be classified under four major headings.

First, there is the distraction of capital flow from the stock markets. The policies of this category have probably no direct connection with the Cheap Money program; but of course the effects of a policy need not be related to the intentions of the policy-makers. Margin regulations for speculative security loans, SEC methods of interference with the marketing technique (and cost) of new issues, etc., are typical of this category.

Second, certain consequences of taxation are relevant. The controversial issue of the effects of high income and inheritance taxes on the volume and direction of investments may be left aside. But it is undoubtedly true that high corporate taxes are a factor driving investment-seeking capital into the bond market, and the more so the higher the tax rates. They are paid at the expense of the income available for the stockholder, who therefore pays twice; at the source as well as in the receiving end, while bondholders only carry the latter burden. The consequent pressure on stock values,—already adversely affected by labor policies and other practices of the New Deal,—automatically favors the flow of funds into bonds.

Third, even more significant are the policies which influence the allocation of bank funds. In the administration of the Banking Law of 1935 examining authorities exert continuous pressure on the banks, tending to direct their funds into government bond channels. In spite of the introduction of industrial term loans, and of F. H. A. loans, examination of loan portfolios has established substantially higher standards since the depression, contributing to the liquidation of old loans and the limitation of extending new ones. However, the incisive effect on the institutional demand for securities has been exerted through the management of bond rather than of loan portfolios. The technique strictly enforced, particularly in the examination of smaller banks, consists in practically eliminating other than so-called high grade bonds as bank investments. High yield bonds usually receive high rating, thus excluding low yield bonds from the rank of the eligibles. The consequence is that the earning assets of banks have to be concentrated in such securities the yield of which is not substantially better than that of comparable government bonds. Moreover, the fact that the largest reservoir of liquid funds is open only to this type of security has naturally helped to raise their prices and to lower their yields, further diminishing their attractiveness as compared to government bonds.

The attractiveness of the latter, especially for institutional portfolios, has been enhanced also by certain central banking and Treasury policies, such as eligibility practices and open market operations which added greatly to the marketability of government securities.[1] The cumulative effect of such policies has been to create the presumption of a ready market for obligations of the Federal Treasury, thus providing the latter artificially with an unique liquidity status, most desirable from the bank's point of view.

Lastly, the extension of the federal government's activities into credit fields previously open only to commercial institutions, an extension financed largely through the sale of bonds issued by federal agencies, was also instrumental in deterring credit demand from its normal channels and reducing the outlets for bank funds.

C. Under the economic and financial circumstances of the post-depression era, and in combination with the methods to influence the supply of funds and the investment channels, price control measures have been and are continuously applied on the capital market. The compulsory elimination of interest on demand deposits—a particular feature of American policy—is an outstanding example of direct and effective price control which could not fail to affect the entire short-term credit structure. Similarly, the interest rate on important outlaying sectors of the capital market, especially in the fields of farm and urban real estate credits, has been brought artificially in line with the general Cheap Money trend. This has been accomplished largely by substituting the government's own credit for, or adding it to that of the private borrower.

The New Supply-Demand Situation

The foregoing is by no means an exhaustive list of recently developed market manipulation practices, the intimate interdependence of which has to be properly understood. Quantitative interference with the supply of funds, qualitative regulation to influence the direction of the investment flow, and interest rate-controls proper, are often three dimensions of the same process rather than three isolated sets of policies. The bond purchases of the Reserve Banks and of Treasury agencies, for example, are or may be distinctly effective in all three dimensions. The threefold result of this array of policies and interferences is the creation of a vast reservoir of potential investment-funds, restriction of the uses to which it may be put, and the injection of incentives (plus constraints, if necessary) to attract them in the direction of government paper—the price of which has been on the upgrade accordingly.

In practice, probably only a few of these policies had been intended or planned to promote the Cheap Money situation, and still fewer have been continuously applied. But the scarcely interrupted decline of interest rates over a period of years can not be understood without realizing the underlying engineering by manifold devices. They were instrumental in creating the money plethora as well as in directing the allocation of funds. They constitute in part the permanent set-up which characterizes the new supply-demand situation of the credit market. In part, they determine the market-psychology, the prevailing expectations with regard to future interest rates. And they also comprise the intermittent policies of market manipulation.

[1] Cf. M. Palyi, *The Journal of Business of the University of Chicago* (January, 1938), "Bond Portfolios and the Capital Market;" and G. Harold, *Bond Ratings as an Investment Guide*, (New York, 1937).

which are decisive at each juncture, and which tend toward creating cumulative effects.

(*A subsequent article, by the same author, will discuss the development of interest rates in the short-term money market, and in individual sectors of the long-term capital market, leading to an appraisal of the future prospects of the interest-rate trend.—Ed.*)

The Relation of Large Scale Production to Certain Costs of Electric Utilities in the United States

By HERSCHEL F. JONES*

THE Public Utility Holding Company Act of 1935 imposed upon the Securities and Exchange Commission the duty of confining the activities of each registered holding company to a single integrated utility system not so large "as to impair the advantages of localized management, *efficient operation,* or the effectiveness of regulation." [1] In its decisions and tentative findings, issued up to the present time, the Commission has stressed the other qualifications to be met by the single integrated system but has not attempted to set up any empirical criteria for the determination of the most economical size of electric utility systems.[2]

This study is the result of an attempt on the part of the writer to find empirical criteria for the determination of an optimum size for electric utility systems. It is a part of a much broader study of the integration of electric power resources in the United States.

The relation of the size of the firm to the unit cost of production has been an important part of economic analysis since the days of Adam Smith. A wide variety of classifications of the advantages of large-scale production exists. It is not necessary, however, in this study to attempt an examination of all such classifications. Any one of a number of such classifications would be adequate for the purpose of this analysis. Two of the most recent studies of the problem have been used, that of J. Maurice Clark, and that of William N. Mitchell.[3]

A synthesis of the classifications presented by these two economists forms the following basic pattern which will be used for this study: (1) economies due to the distribution or allocation of certain overhead costs over a larger number of units produced; (2) economies due to the utilization of larger mechanical units; (3) economies due to the increased specialization of men and machines; and (4) economies due to buying and selling in larger quantities. In discussing the first group of advantages, Mitchell states:

"The mechanization of industry, the development of industrial research, and the modern necessity for securing rare executive talent and the costly services of managerial specialists, all have tended to place upon industry an enormous burden of overhead cost which can be borne successfully only when the output is correspondingly great. Mass production seemingly provides the only avenue of escape." [4]

It is clear that Mr. Mitchell believes that the overhead costs of this type are necessary for production, that they are constant costs, and that they cannot be borne by small firms. Overhead costs of this type do exist but they are probably of less importance than other overhead costs which are not constant but rather increase at a slower rate than the increase in output. In any event it is clear that the large firm has a definite advantage over the small firm in meeting costs in these categories.

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[1] Section 11 (b) (1) (C), Public Utility Holding Company Act, 1935.

[2] For a detailed discussion of the work of the SEC in enforcing Section 11 (b) (1) of the Act, Cf. Blum, Robert, "SEC Integration of Holding Company Systems," *Journal of Land and Public Utility Economics,* November, 1941.

[3] *Studies in the Economics of Overhead Cost,* J. M. Clark, Chicago, 1923; and *Organization and Management of Production,* W. N. Mitchell, New York, 1939.

[4] Mitchell, *op. cit.,* p. 38.

The second group of advantages is stated in Clark's terms. What Clark means is the relationship between size (in terms of capacity of output) and the capital cost of the machine, as well as the operating cost of the machine in terms of the labor and power necessary for its operation. Many examples could be given of such physical economies of large mechanical units. Thus a 20,000 kilowatt turbine-generator unit does not cost twice as much as a 10,000 kilowatt unit, nor does it take twice as many men to operate it. This is true, of course, of only a limited class of machinery and within certain definite limits of size. The class of machinery (and other capital goods such as buildings) is called the "container group," in which the volume of the machine or building varies as the cube of the dimensions, while the surface area varies with the square of the dimensions. Clark makes it clear that because machines are used in combinations, the economies obtained by increasing the size of a machine of the container group can be passed on to machines of other groups as well. As he puts the case:

"Efficiency is a proportion between things you want and things you do not want, and some of the things are bound to increase faster than others, as the working units get bigger . . . If we cannot get a gain by increasing the size of one kind of unit, we can merely multiply the number of these units, and generally we will still get a gain through the increased size or fuller utilization of some other unit that works along with them . . . So long as this increased number of units can be harnessed together mechanically, there will be no difficulty in making them pull together, but if pulling together depends upon human organization we may reach the limit of profitable size through reaching the limit of our own organizing power." [5]

The economies due to increased specialization of men and machines were perhaps the first advantages of large-scale production to be discussed in economic circles. Adam Smith, with his example of the manufacture of pins, pointed out the very great advantage which specialization of labor gave to the large-scale producer. In the same way that only the large producer can keep a worker busy doing a single task, it is only the large producer who can afford to have a machine that does only one thing. The savings arise from the specialization of the worker because he gains skill and dexterity, because he saves the time normally consumed in passing from one task to another, because simplification of the job shortens the necessary training time, and because specialization lends encouragement to the invention of machines and other labor-saving devices.

The final classification of economies are those due to buying and selling in large quantities. In one sense, these economies are the result of the increased economic power of the large firm. While it is true that the cost of selling a large order is less per unit than that of a small order, the economic power of the firms engaged in the transaction will determine which one of them obtains the advantage of lower cost or whether it will be split between them.

Not all types of businesses are able to obtain the economies or advantages of large scale production outlined above. Mitchell claims that those businesses which will reap the most benefit from an increase in the scale of production are those which (a) have a highly standardized product, (b) have a continuous process of production, and (c) have a high proportion of overhead (i.e., constant) cost to total cost.[6]

It is clear that electric utility com-

[5] Clark, *op. cit.*, pp. 113-117.

[6] Mitchell, *op. cit.*, Chapter III.

panies meet these qualifications in every respect. We should expect, therefore, to find the advantages of large-scale production exemplified by the operations of such companies. It is not possible, however, from the data available, to establish the presence of these advantages empirically. Any attempt to do so would run into a number of difficulties which are practically insurmountable. First, many things in addition to size, condition the cost of producing and selling a kilowatt hour of electricity. Second, electric utilities have much less choice as to their size than other businesses. They must serve their market be it large or small and the size of the market is mostly due to the accident of geographical location. Finally, while cost data for electric utility operating companies are more available than for most industries, they are still far from adequate for an empirical study of the advantages of large scale production.

The problem, however, may be attacked from another angle. While it is not possible to discover whether large electric utility operating units actually enjoy the advantages of spreading specific overhead costs over a larger number of units, it is possible to take certain groups of expense items for a large number of companies and compare the variations in costs with the variations in the size of the companies.

Such an approach to the problem does not solve all of the difficulties noted above. It is still impossible to eliminate the other factors, in addition to the factor of size, which influence costs. But by grouping a large number of companies together, and using average costs and average sizes for the groups, it can be assumed that a large number of the other factors will cancel themselves and their influence on the costs of the utilities so combined.[7]

In 1941 the Federal Power Commission published its third annual compilation of balance sheets, operating statements, and operating statistics of class A and B electric utilities in the United States. This compilation was based upon the 1939 statements of 383 electric utilities operating in the United States which had electric revenues of $250,000 or more in 1939.[8] Also in 1941, the Federal Power Commission published a companion volume to the *Statistics*, which gives group averages for many of the costs of the operating companies.[9] This latter volume is based upon the 1938 statements of the electric utilities reporting to the Commission.[10]

As a part of the present study, three major comparisons of size and cost have

[7] This is true for only those factors which do not have a degree of correlation (direct or inverse) with the factor of size. A long list of such factors could be compiled. Such a list would include mean annual temperature, mean annual rainfall, other climatic factors, density of population, methods of regulation, etc.

[8] Federal Power Commission, *Statistics of Electric Utilities in the United States, 1939*, Washington, D. C., 1941.

[9] Federal Power Commission, *Electric Utility Cost Units and Ratios, 1938*, Washington, D. C., 1941.

[10] All companies reporting to the Federal Power Commission are legally required to conform to the uniform accounting system set up by the Commission. It is doubtful, however, that all companies are actually complying fully with the law. For example, the Hartford Electric Company as late as December 1941 was still maintaining its right to keep accounts in accordance with the system prescribed by the Connecticut Commission. (Cf. FPC Release No. 1788.) To the extent that the operating companies keep their accounts in different ways, the data in the FPC publications are not subject to comparison and hence any analysis based on the data must be inaccurate. Unfortunately there is no way of determining the extent of such inaccuracies. It is to be expected, of course, that the compilers of the data made such adjustments as were possible to correct such inaccuracies.

been made using the *Statistics* for data:[11] first, production cost per kilowatt hour compared with the size of the operating units as measured by the total number of kilowatt hours produced; second, distribution cost plus customer accounting and collecting expense per customer per year compared with the size of the operating units as measured by the total number of customers served; and third, average rate of interest paid on bonds outstanding compared with the size of operating units as measured by the total dollar book value of assets.

The results of these comparisons are presented in the accompanying charts and tables. Charts I (A), I (B), and I (C) show the relationship of the production cost per kilowatt hour and the size of the operating utilities as measured by the total production of electricity in 1939. Chart II shows the relationship of distribution costs plus customer accounting and collection expenses per customer and the size of the operating utilities as measured by the total number of customers for the year 1939. Chart III shows the relationship of the average rate of interest paid on bonded indebtedness and the size of the operating utilities as measured by the total dollar book value of assets.

In computing the cost of producing a kilowatt hour, total production costs were divided by the total number of kilowatt hours produced by each company for the year 1939. The companies were then divided into four groups: those which produced more energy in steam plants than in any other manner, Chart I (A); those which produced more energy in hydro-electric plants than in any other manner, Chart I (B); those which produced more energy in internal combustion plants than in any other manner; and those which purchased more energy than they generated, Chart I (C). These groups are designated as steam, hydro-electric, internal combustion, and purchasing. Only six operating companies fell into the internal combustion group, and because of the smallness of the sample no further computations were made for this group.

The companies in each of the other three groups (steam, hydro-electric, and purchasing) were ranked in the order of their total kilowatt hour output. On the basis of this ranking each group was subdivided into a number of smaller groups which contained from 14 to 17 companies of nearly the same size. An arithmetic average was then computed for the average kilowatt hour output and for the average production cost per kilowatt hour (produced or purchased). These group averages were then plotted and fitted with a free-hand curve on semi-logarithmic paper.

The same general technique was followed in computing the other two relationships. Distribution plus customer accounting and collection expenses per customer were first calculated for each of 328 companies.[12] The companies were then ranked in accordance with the number of customers served and divided into eight groups of 41 companies each. Again simple averages were struck for each group and the results plotted.

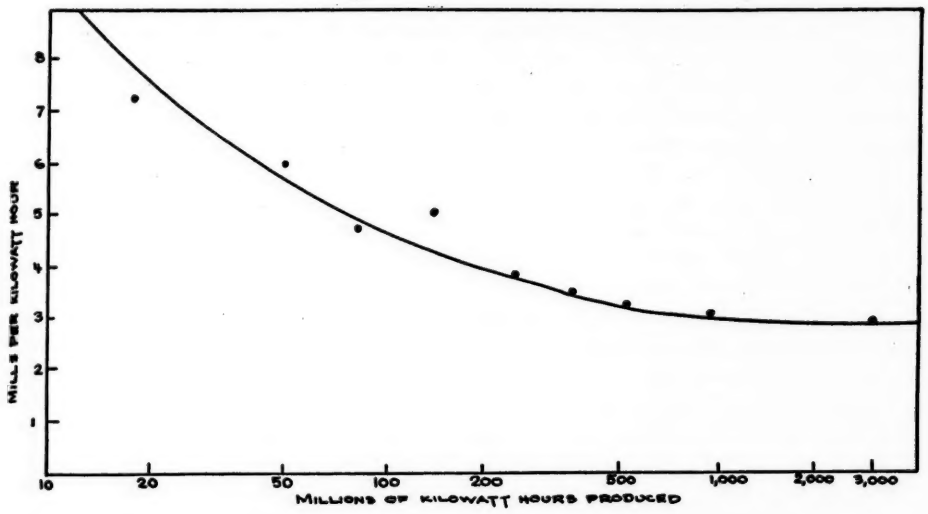
In computing the relationship between

[11] A fourth comparison is still in the computing stage. It is a comparison of general and administrative costs per kilowatt hour of energy sold, compared with the size of the operating units in terms of area served, and/or the greatest distance from the administrative office of the operating utility to a load center.

[12] The other reporting companies either had no customers or only a very few. They were excluded from the sample because in most cases they served only utilities or large industries and their costs for distribution and for customer accounting and collection were highly irregular.

CHART I (A)

AVERAGE PRODUCTION COSTS IN MILLS PER KILOWATT HOUR, CLASS A & B UTILITIES PRODUCING MOST OF THEIR ENERGY IN STEAM-ELECTRIC PLANTS, 1939.



Number of Companies	Total Energy Output (1,000 k.w.h.) Range	Average	Production Cost per k.w.h. (Mills) Average	Median	Range
17	10,600 — 32,877	18,017	7.307	7.68	9.07 — 5.66
16	35,250 — 65,529	50,517	6.024	5.71	8.97 — 4.08
16	67,100 — 104,297	85,527	4.758	4.45	7.86 — 2.24
16	104,311 — 195,787	142,824	5.096	5.69	9.95 — 1.28
16	201,261 — 308,115	248,952	3.631	3.13	7.62 — 2.17
16	308,588 — 431,438	365,724	3.399	3.38	5.37 — 1.41
16	456,361 — 680,759	531,748	3.127	2.99	4.86 — 2.06
16	685,807 — 1,453,365	927,499	2.995	2.85	4.97 — 1.61
16	1,522,848 — 7,555,724	2,909,027	2.815	2.65	4.77 — 1.65

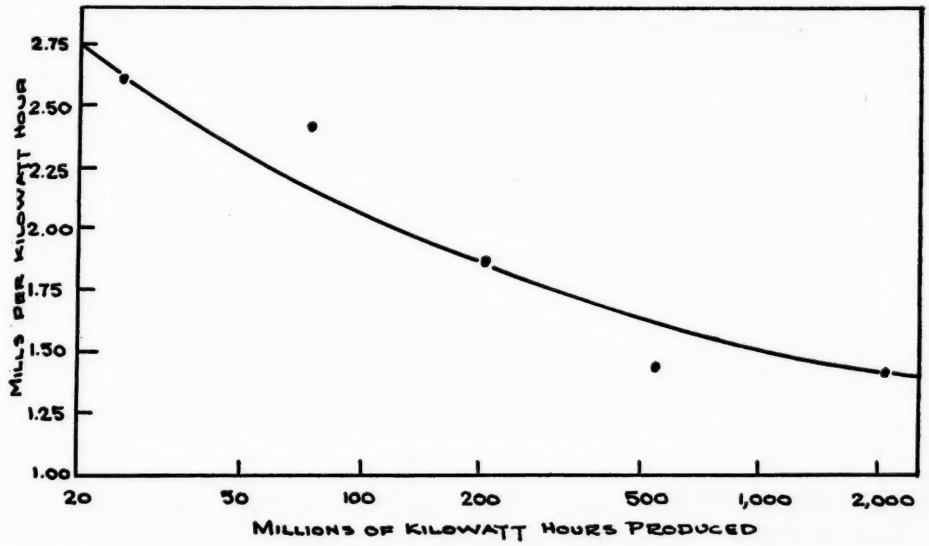
Source: Data taken from Federal Power Commission's *Statistics, 1939.*

the average rate of interest paid on bonded indebtedness and the total book value of assets of the companies, the rate of interest paid on each issue was multiplied by the face value of the outstanding bonds of that issue. The interest for all issues of each company was then added and the sum divided by the total face value of the outstanding issues for each company. The companies were then grouped according to size and simple averages computed for each group.

In every case there appears to be an inverse relationship of costs to size which confirms the thesis that electric utility companies enjoy the advantages of large scale production. Only in Chart III is there a large positive inclination of the fitted curve to the right of the chart which justified the conclusion that the point of optimum size has been reached and passed. In most of the other cases, however, it would seem that the rate of decline of the cost has diminished to the

CHART I (B)

AVERAGE PRODUCTION COSTS IN MILLS PER KILOWATT HOUR, CLASS A & B UTILITIES PRODUCING MOST OF THEIR ENERGY IN HYDRO-ELECTRIC PLANTS, 1939.



Number of Companies	Total Energy Output (1,000 k.w.h.)		Production Cost per k.w.h. (Mills)		
	Range	Average	Average	Median	Range
14	15,610 — 37,537	25,396	2.603	2.342	.909 — 6.561
14	42,851 — 100,913	74,316	2.408	2.355	.342 — 5.883
14	112,401 — 319,486	209,411	1.865	1.384	.376 — 6.171
14	347,846 — 837,147	540,063	1.441	1.228	.286 — 3.534
14	963,047 — 5,728,388	2,074,394	1.437	1.132	.306 — 4.148

Source: Data taken from Federal Power Commission's *Statistics, 1939.*

point that little additional benefit can be expected from a further increase in the size of operating units under present methods of operation.

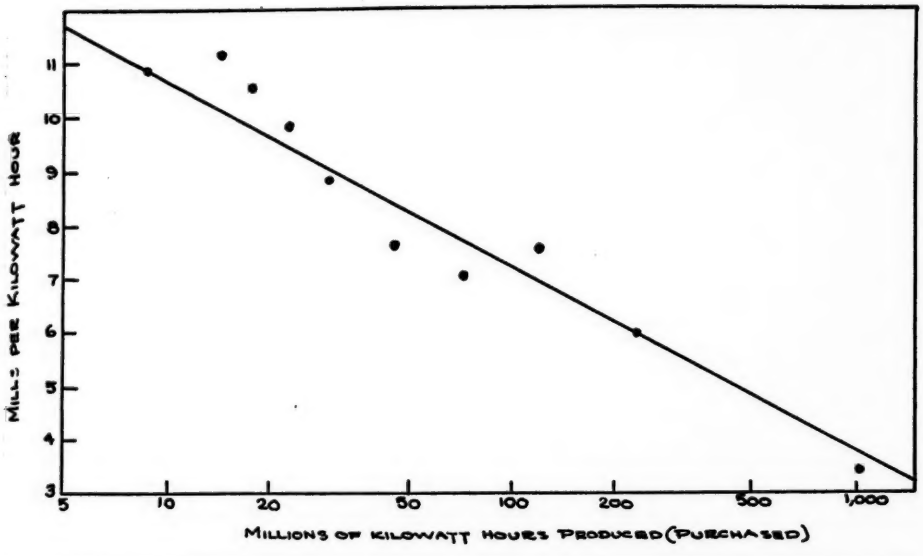
The advantages of large scale production, and particularly the economies due to the utilization of larger mechanical units are further confirmed in the electric utility industry by a study of the Federal Power Commission published in 1941. This study, *Electric Utility Cost Units and Ratios,* presents a series of four tables and charts comparing costs of utility companies with their size.[18]

Three of these charts show the relationship of investment per kilowatt of capacity to size of generating station as measured by total kilowatt capacity. In each chart the investment is subdivided into land, building and equipment. For hydro-electric stations a further subdivision is made for reservoirs, dams and waterways.

[18] Federal Power Commission, *op. cit.*, Table 1, Figure 1; Table 2, Figure 2; Table 3, Figure 3; Table 19, Figure 14.

CHART I (C)

AVERAGE PRODUCTION COSTS IN MILLS PER KILOWATT HOUR, CLASS A & B UTILITIES PURCHASING MOST OF THEIR ENERGY, 1939.



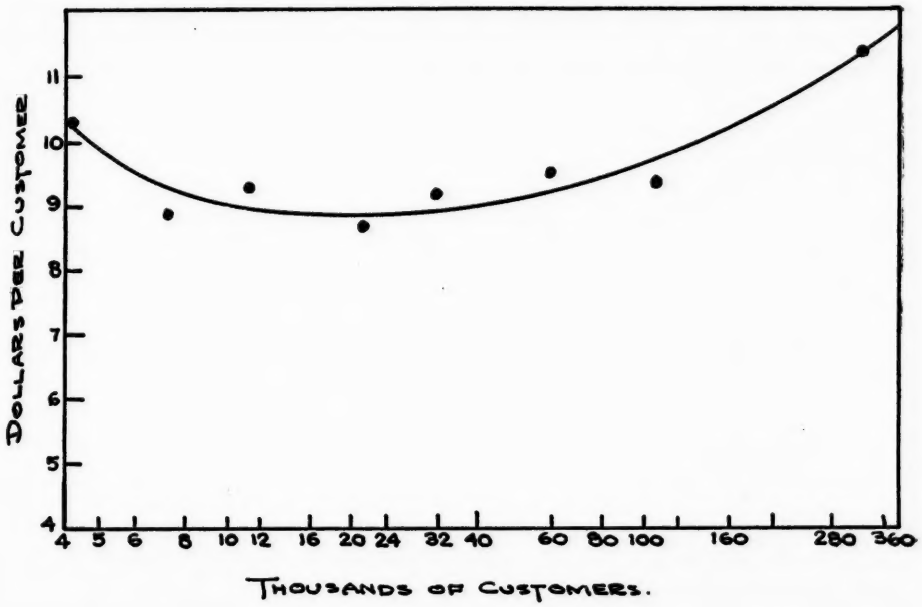
Number of Companies	Total Energy Output (1,000 k.w.h.)		Production Cost per k.w.h. (Mills)		
	Range	Average	Average	Median	Range
17	5,746 — 11,842	8,810	10.863	12.185	.99 — 16.46
15	12,709 — 15,729	14,427	11.085	10.278	8.25 — 15.67
15	16,197 — 19,295	17,653	10.530	10.648	.99 — 14.39
15	19,632 — 25,412	22,540	9.843	10.087	6.78 — 13.84
15	26,631 — 32,867	29,168	8.836	8.871	3.99 — 12.78
15	36,655 — 57,835	45,029	7.581	7.518	3.45 — 12.18
15	60,018 — 86,238	71,892	7.010	6.614	3.24 — 10.91
15	86,822 — 167,510	121,740	7.547	7.871	3.33 — 12.06
15	185,843 — 332,958	237,643	5.915	5.738	3.95 — 8.63
15	485,938 — 1,733,873	1,017,590	3.378	3.134	.24 — 5.83

Source: Federal Power Commission's *Statistics, 1939.*

Total investment per kilowatt of capacity for 150 steam generating stations, as shown by the first of these charts, ranges from $169 per kilowatt for stations of less than 1,000 kilowatt capacity (average capacity 635 kilowatts) to $98 per kilowatt for stations with more than 200,000 kilowatts of capacity (average capacity 355,545 kilowatts). Most of the decrease in unit investment, however, is achieved by plants with capacities ranging from 5,010 kilowatts to 10,000 kilowatts (average 7,211 kilowatts), since this group has an average total investment of only $107 per kilowatt. The most significant decrease in unit investment occurs in the cost of the equipment. In fact, the equipment investment curve is essentially homologous with the total investment curve.

CHART II

ACCOUNTING, COLLECTION, AND DISTRIBUTION COSTS PER CUSTOMER — CLASS A & B UTILITIES, 1939.



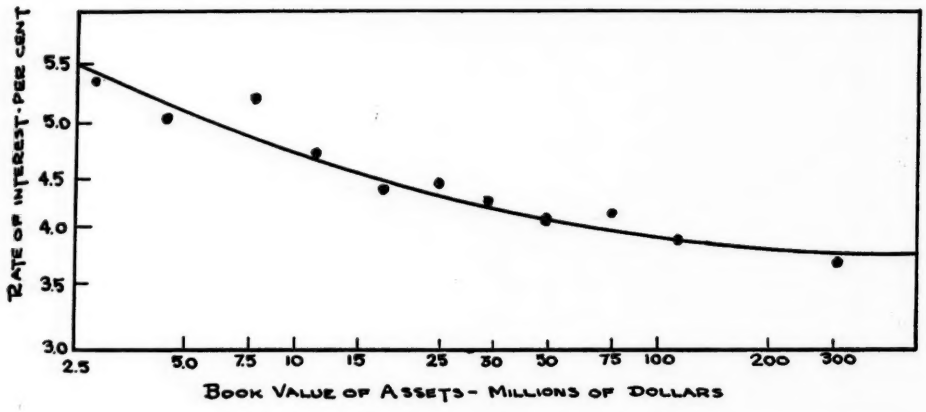
Number of Companies	Number of Customers		Cost per Customer		
	Range	Average	Average	Median	Range
41	1,518 — 5,700	4,129	$10.36	$10.56	$5.36 — $18.25
41	5,735 — 8,517	7,058	8.85	9.04	5.35 — 16.93
41	8,594 — 15,295	11,197	9.25	8.51	5.74 — 16.04
41	15,347 — 25,401	20,623	8.72	8.56	4.50 — 15.81
41	26,033 — 43,777	35,134	9.15	9.03	5.35 — 16.97
41	43,950 — 75,903	59,268	9.53	8.88	4.22 — 14.28
41	76,511 — 145,528	104,931	9.37	8.93	6.00 — 13.67
41	145,580 — 949,932	324,463	11.22	10.93	5.97 — 16.42

Source: Federal Power Commission's *Statistics, 1939.*

Two hundred and sixty-three hydroelectric stations are included in the second investment chart presented in this study. Total investment per kilowatt of capacity ranges from $345 for stations with less than 500 kilowatts of capacity (average 270 kilowatts) to $159 per kilowatt for stations with capacities of more than 100,000 kilowatts but less than 200,000 kilowatts (average 119,800 kilowatts). Here again most of the decrease in unit investment is achieved by plants with capacities between 10,010 and 20,000 kilowatts (average 14,865 kilowatts), which had an average total investment of $177 per kilowatt. For hydroelectric plants the most significant decrease in unit investment occurs in the

CHART III

AVERAGE RATE OF INTEREST PAID ON BONDS
CLASS A & B UTILITIES, 1939.



Number of Companies	Book Value of Assets (000)		Interest Rate on Bonds, Percent			
	Range	Average	Average	Median	Mode	Range
25	$ 2,041 — $ 3,364	$ 2,760	5.37	5.50	6.00	4.25 — 7.00
25	3,771 — 5,893	4,603	5.01	5.00	5.00	3.75 — 7.00
25	6,005 — 9,232	7,565	5.19	5.00	5.00	3.96 — 8.00
25	19,546 — 14,267	11,530	4.78	5.00	5.00	3.13 — 6.15
25	14,412 — 20,241	17,474	4.44	4.47	5.00	3.50 — 6.50
25	20,477 — 30,626	24,814	4.48	4.25	5.00	3.37 — 5.84
25	30,783 — 43,999	36,280	4.30	4.50	4.75	3.00 — 5.49
25	44,103 — 59,797	51,413	4.14	4.00	4.00	3.19 — 5.50
25	60,326 — 86,974	73,575	4.21	3.99	3.50	3.42 — 6.00
25	87,088 — 147,537	113,428	4.00	3.80	3.78	3.25 — 5.30
24	151,119 — 1,064,394	312,147	3.75	3.68	3.50	3.36 — 5.33

Source: Federal Power Commission's *Statistics, 1939.*

investment in reservoirs, dams, waterways, and land.

The relationship of unit investment to total capacity for internal combustion plants is computed from data on 95 plants. Investment per kilowatt of capacity ranges from $267 for stations with less than 250 kilowatts (average 154 kilowatts) to $127 per kilowatt for one station with a capacity of 13,365 kilowatts. Stations with an average of only 2,742 kilowatts of capacity, however, achieved a unit investment of $131 per kilowatt. As in the case of steam-electric plants, the greatest decrease in unit investment occurs in the cost of equipment.

The fourth chart published by the Federal Power Commission shows the relation of accounting and collecting expenses per customer to the number of customers per company. This relationship is similar to that in Chart III except that it does not include distribution costs per customer. The Commission's chart shows the same general relationship between costs and size as the writer's study reveals. The per customer expense is

high ($3.73) for small companies with less than 5,000 customers (average 3,980), lowest for medium-sized companies ($3.04 for companies with an average of 72,128 customers), and high again for large companies with more than 500,000 customers ($3.51 per customer for companies with an average of 743,812 customers). The curve is quite flat in the central section since companies with an average of 38,699 customers had average customer costs of only $3.05.

Further evidence concerning the advantage of large scale operation in the electric utility industry is presented by A. E. Knowlton, associate editor of the *Electrical World,* in an article titled, "4th Steam Station Cost Survey."[14] Of particular interest is his conclusion that the optimum size of steam generating stations has already been reached and that little if any advantage is to be obtained by building still larger stations. According to his analysis:

"For example, the trend is already away from large plants everywhere except in large metropolitan areas, where suitable plant sites and land costs are overriding determinants. This analysis shows that in addition to carrying all the detriments of more bigness, they are at a disadvantage from several angles of performance. When put on a comparable basis of operation the large plants show no dominant advantage in fuel economy. They show higher unit production cost and only slight advantage in overall cost per kilowatt hour."[15]

The *Steam Station Cost Survey* is an intensive study of a small "representative" sample. Fifty-six steam stations which vary in size from less than 20,000 kilowatts to over 200,000 kilowatts are used. Actual production costs and fixed charges as reported by station managers indicate that, as operated, the large stations enjoy a slight advantage in over-all production cost (including fixed charges) per kilowatt hour. Thus, the direct costs of fuel, labor, and maintenance will average about three mills per kilowatt-hour for each group of plants, irrespective of size, while fixed costs decline from about seven mills per kilowatt-hour for the smallest plants to less than five mills per kilowatt-hour for the largest plants.

This advantage, however, is largely the result of the reported load carried by the plants. If a uniform 50 percent plant factor and a uniform utilization favor of 90 per cent are applied to the reported data, the over-all cost per kilowatt-hour declines from slightly over seven mills for the smallest plants, to slightly more than six and one-half mills for the largest plants. If fixed costs are ignored, the smallest plants actually show a lower per kilowatt-hour operating cost (2.6 mills) than the largest plants (more than 3 mills.)[16]

In spite of the fact that the investigation of the relation of size to cost of production for electric utility operating companies is far from complete, the studies referred to above confirm the participation of electric utilities as an industry in the advantages of large scale production. With due respect for the limitations of the method of analysis used, it seems safe to state the following tentative conclusions:

1. There is an inverse correlation between the number of kilowatt-hours produced (actually kilowatt-hour input) and the direct or operating cost per kilowatt-hour produced. In the case of electric utilities producing more of their energy in hydro-electric or steam plants

[14] *Electrical World,* December 2, 1939, vol. 112, pp. 1585 *ff.*

[15] *Ibid.,* p. 1585.

[16] *Ibid.,* p. 1599.

than in any other manner, the largest utilities seem to be approaching a limit beyond which any increase in size will result in negligible decreases in production costs per kilowatt-hour. In the case of electric utilities which purchase most of their available energy, no such limit is yet in sight.

2. The combined distribution and customer accounting and collection expenses of the utilities when computed on a per customer per year basis show an inverse relationship to the number of customers per utility until the size of the utility reaches more than 20,000 customers. The relationship then becomes positive with such costs per customer increasing as the number of customers per utility company increases.

If distribution costs are not included in the computation, the reversal of trend occurs at about 40,000 customers.

3. The rate of interest paid by electric utilities on their outstanding bonded indebtedness shows an inverse relationship with total assets of the utilities having bonded indebtedness. This trend also seems to be approaching a limit in size beyond which the reduction in the interest rate, as the size increases, promises to be negligible.

4. The investment in generating stations per kilowatt of capacity shows an inverse relationship with the size of the generating plant. This is true for hydro-electric, steam-electric, and internal combustion electric generating plants. In all cases, however, it is clear that investment per kilowatt is approaching a lower limit so that further increases in the size of plants do not promise very much in the form of further economies in investment.

5. As operated at present, steam-electric generating stations of the largest size seem to have an over-all advantage of about two mills per kilowatt-hour in total cost per kilowatt-hour. This advantage seems to be the result of lower fixed cost per kilowatt-hour produced. Most of this advantage, however, disappears if uniform operating conditions are imposed upon the plants. Under the latter assumption the advantage of the largest plants over the smallest plants is approximately one-half mill per kilowatt-hour.

It would seem from this analysis that the largest utilities and the largest generating plants of existing utilities have all approached the size where optimum costs are to be obtained. Such a conclusion, however, could be readily invalidated by technical innovations in the production, transmission, and distribution of electric energy. In view of the rapid and continual progress that has been made in the electric utility industry in the relatively short span of its life, few would be so brave as to predict a static technology for the industry in the future. The conservative analyst will, therefore, be extremely careful in the use of the above conclusions in future situations until after he has checked the technical progress in the electric utility industry.

Zoning Land for Recreation

By GEORGE S. WEHRWEIN* and HUGH A. JOHNSON **

RECREATION as a land use was recognized in the first rural zoning ordinance which was enacted in Oneida County, Wisconsin, in 1933. Of 10 permitted uses listed by Oneida County in its "Forestry and Recreation District", five are directly related to recreation: (1) public and private parks, playgrounds, camp grounds and golf grounds; (2) recreational camps and resorts; (3) private summer cottages and service buildings; (4) hunting and fishing cabins; (5) boat liveries,—and "trappers' cabins" might also be put into this category. By implication (since they are *not* listed) agriculture, year-long residence, all forms of business and industries are excluded.[1]

Oneida, although it is one of the counties with a high stage of recreational development, did not set up a "recreational district" *per se*. Vilas, the second county to enact a zoning ordinance, was the first to introduce this type of district. The reason for a separate district is that many of the resort and summer home owners find it necessary to maintain caretakers during the entire year and these families have to be furnished with schools, roads and other public services. Considering the fact that recreational property was paying more than half of the local taxes of Vilas County, although it occupied only 15% of the land area of the county, this was not an unreasonable concession and it involved merely the permission of year-long residences in addition to the other enumerated uses of a forestry district. Thus the only permitted "use" determining the distribution of population, is the one involving *occupancy* and not "land use." The chief prohibited use in Vilas County and all subsequent ordinances setting up a recreational zone was agriculture. Many of the later ordinances added the "explanation" that farms "shall be prohibited because of the fire hazard involved in clearing operations and spoliation of forested conditions adjacent to highly developed recreation property. Such properties demand the maintenance of a maximum of natural conditions to retain their fullest economic value."[2] Ten counties have recreational districts identical with those of Vilas County, restricting 297,000 acres as compared with 5,005,000 acres of forestry districts in which year-long residence is prohibited.[3]

Almost 10 years have elapsed since Oneida County enacted the first rural zoning ordinance and it was felt that the time had come for "stock taking." In 1938 a study was begun by the Wisconsin Agricultural Experiment Station in cooperation with the Bureau of Agricultural Economics and continued in succeeding years to appraise the results of zoning and the trends in the economy of the region.[4] It has long been recognized that the fu-

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[1] Mines, quarries, gravel pits, hydro-electric lines and their accessories are *permitted* by all the zoning ordinances of the north.

[2] This explanation is to be found in all except the Vilas County ordinance.

[3] Douglas made provision for the recreational district in its ordinance but has not as yet set up any districts. Langlade, by amendment, has abolished its recreational district but did not change the ordinance. Future recreational districts may therefore be established in these two counties.

[4] Figures and data, unless otherwise stated, in this article are from this study as presented in a University of Wisconsin Master's thesis submitted by Hugh A. Johnson, the junior author, in 1941.

ture economy of the cut-over area would be a "balanced land use" depending predominantly on agriculture, forestry and recreation and of combinations of the occupations associated with or dependent upon these land uses. Mining is important only locally and manufacturing of products depending on imported raw materials cannot become important sources of employment. It will be the purpose of this discussion to deal primarily with zoning for recreation and its relation to agriculture.

The importance of recreation as a form of land use and in the economy of the Great Lakes region was revealed by a study of two highly developed recreational counties in northern Wisconsin in 1931-32.[5] It was pointed out that recreational land paid a large share of the real estate taxes, contributed to the support of local people by "tourist expenditures" and complemented forestry and agriculture. It also showed the tendency to oversupply recreational land since more than 16,000 lots had been platted by real estate developers during the first three decades of this century in the two counties studied, of which about 1,800 were occupied by resorts, cottages or summer homes. Seven-eighths were "idle" similar to the "over-developed" residential property in the "rural-urban fringe" but fortunately without the public and private costs for public utilities—the roads, sidewalks, water, sewerage, gas and electricity which had to be supplied to make "urban land" out of farms.

Since the purchase of land for summer homes, cottages, and resorts is a luxury expenditure it was feared that the demand for riparian summer home sites would drop sharply after the depression of 1929-30. The traffic figures for 1931 were reassuring. According to the calculations made by the Wisconsin Highway Commission more cars entered the State in 1931 than in 1929 or in previous years but the expenditures per person per day were only 44% of that of 1929.[6] These data, however, gave no clue to the trend in the demand for recreational land.

A study of 122 recreational land owners in Oneida, Vilas, and Langlade counties and a few samples obtained in the northwestern counties of the State, made in 1939, however, showed that in spite of the depression recreational land had been bought after 1930. Table I shows that almost one-fourth of the resorts, camps and summer homes visited had been acquired within 5 years before 1939, and 17.2% since 1930. As would be expected, the bulk of the owners acquired their properties during the post-war "good times"—almost 40% had bought between 1919 and 1928,— and 19% have owned their properties 20 years or more. This latter group includes 15 of the 58 resorts and 6 of the 60 summer homes.

TABLE I. YEARS SINCE OWNERSHIP WAS ACQUIRED AS REPORTED BY 122 RECREATIONAL LAND OWNERS IN 1939

	Years Since Acquisition				
	1-4	5-9	10-20	20+	Total
Type of Owner					
Resorts	11	11	21	15	58
Boys and Girls Camps	....	....	2	2	4
Summer Homes	19	10	25	6	60
Total	30	21	48	23	122
Per Cent	24.6	17.2	39.3	18.9	100.0

These figures are significant also in

[5] George S. Wehrwein and Kenneth H. Parsons, "Recreation as a Land Use," Wisconsin Agricultural Experiment Station Bulletin 422 (1932). Cf. also, Wilbur O. Hedrick, "Recreational Uses of Michigan Cut-Over Lands," Mich. Agric. Exp. Station, *Special Bulletin*, 247, (1934); H. J. Andrews and W. S. Bromley, *Trends in Land Use in Northern Michigan*, Washington, D. C.: The Charles Lathrop Pack Foundation, 1941.

[6] Wehrwein and Parsons, *op. cit.*, p. 8.

pointing out the relative stability of recreational property in spite of the urban depression. Nevertheless, some resorts became bankrupt and were taken over by creditors and many recreational properties were allowed to remain idle for a season or longer during the depths of the "business cycle." From this small sample, it is true, no definite statement can be made for the recreational "industry" as a whole other than that general business conditions do not seem to have had as severe an effect upon recreational land ownership as on some other forms of land ownership. The loss of income due to lack of patronage caused much financial difficulty among the resorts, but this, of course, would not affect the summer home owners.

Around 1930 the statement was often heard that the automobile would drastically affect ownership of recreational properties. It was said that the auto owner would not want to be tied down to one place; he preferred to see as much country as possible and would go to different recreational areas each year. However, since then we have learned that the majority of vacationists do not take "transcontinental" trips or even go long distances, but have time, money and inclination to visit recreational places within a reasonable distance from their homes.[7] From the data just cited it appears that the automobile has had little effect on the ownership of recreational land; in fact the motor car has made it possible for heads of families to commute for weekends or short periods to summer homes at which the family stays for weeks and even months. The tourists who have not invested in land, especially the younger people, and those without children are more mobile, however; they stay at a resort for a shorter period than in the olden days and travel more widely during their vacations. It is doubtful, however, if they became summer home owners to any extent previous to the advent of the automobile.

The difference in the length of stay between the home owners and guests at resorts is significant. Of the 71 guests who reported on the length of their expected stay, almost 1/3 said they planned to stay only one week, and 40% for 2 weeks. On the other hand, 37% of the summer home owners said they expected to stay from 9 to 12 weeks and 35% more than 12 weeks. Less than 5% reported that they expected to remain 2 weeks or less in their summer homes.

The age of the head of the family seems to have a definite relationship to the length of stay. The younger people have relatively shorter vacations and are less well established financially. As might be expected, the age of the home owners was greater than that of the guests at resorts or those renting recreational facilities. The number and age of the children do not seem to be a limiting factor.

The length of stay in the vacation country is of importance not only to the resort owner who caters to guests and rents cottages but also to farmers, guides, storekeepers, garage men and others who must make most of their year's income during the short "tourist season."

Recreation and Agriculture

When it is stated that over 6 million people entered Wisconsin in 1931 in their own automobiles of which more than half came for recreation, or, that Vilas County is visited by 200,000 people during the summer, one immediately thinks of the fact that these thousands of people must be housed and fed and

[7] L. E. Peabody and I. M. Spashoff, "Tourist Travel in the United States," *Public Roads*, August, 1937.

that the farmers of the north should capitalize on this situation. However, the very factors which make the north a fine recreational area, such as the cool summers and occasional long periods without rain, severely limit agriculture and gardening. The springs are cold and late and gardens are usually not planted until June and in many places are subject to frosts during the remainder of the summer. Soils are infertile over much of the area, the good soils suitable for agriculture being about 20% of the cut-over region of the three Lake States. Within the area studied many of the farmers were beyond their prime in years and their children had left for the cities. Many of the so-called "farms" will eventually be abandoned as soon as the present operators die or retire. Nevertheless, there are cases where enterprising farmers have adjusted their operations to the demands of the "tourist trade" and sell milk, cottage cheese, vegetables, berries, eggs, poultry and forest products. In some cases successful roadside stands are being operated where local products are sold to tourists.

A study of the source of milk used by the tourists showed that 45% secured their milk, either raw or pasteurized, from stores, 20% buy directly from farmers at the farm, 18% buy from farmers who deliver to their customers, 11% buy from trucks which deliver milk, usually pasteurized, while about 6% have their own cows. This last group consists of 10 resort owners and one summer home owner. Pasteurization is a "bottleneck" which keeps many tourists from buying directly from the producer. Very few farmers have enough cows or business to warrant the expense of installing pasteurizers, so 70% of this type of milk is retailed through stores. Furthermore, the producer finds the tourists an uncertain market. Families stay only a short time and often fail to notify the farmer when they are leaving. Hence farmers often save milk which is not called for. The same difficulty is encountered where farmers attempt to carry on a small delivery route. The most satisfactory compromise, both from the standpoint of merchandising and of preserving the freshness of the product, is to let the local store carry the milk.

It was surprising to find that about 8% reported buying "home-made" butter from farmers. About 1/5 of the tourists reported buying all of their eggs and poultry from farmers; on the other hand, 70% said they bought no eggs or poultry at all while in the area. One reason is their short stay, and another is that many families bring supplies from home. Only 11% bought all their vegetables from farmers and another 16% bought up to 50% from this source. The proportion was even less in the case of locally produced fruits and berries. One reason is that urban people are used to buying at stores and do not know where to find other sources. The wayside market or advertising is a partial answer. The other reason is that the supply of these products is limited and not always of the quality to which summer visitors are accustomed. However, the success of a few farm markets indicates that many of these obstacles are not insurmountable.

Another phase of the study involved an analysis of the source of income of 105 farms in a well established recreation area lying in Oneida and Vilas counties. This part of the study revealed that farmers had three sources of income: (1) sale of products raised on the farm or AAA payments; (2) income from recreation associated with the farm itself; and (3) outside income, much of which came from the tourist industry.

It is important to note that only 2/3

of the 105 farmers reported any income from dairy products, the same percentage as reported receiving AAA payments, and in some cases the income from both sources was almost identical. Potatoes furnished some income for 42% of the farmers, and fruits and vegetables for 31%. Moreover, a study of the marketing practices of these farmers showed that most of the products are not sold locally. Milk was sold in Eagle River, Rhinelander and Minocqua, cities in the vicinity of this area, or it was even shipped to Green Bay and other cities as cream. Potatoes are sold to dealers who come to the markets in the fall. Eggs and berries are sold or traded at the stores, but most of the vegetables were sold at the farms; however, this market is limited to those farms adjoining the main highways.

The Farm Resort as a Business

Theoretically a good case can be made for a dual use of land suitable for recreation, namely, farming combined with a resort or rental cottages. Since the season is short, recreational buildings stand idle for 8 or 9 months of the year and are subject to deterioration, destruction and vandalism during this time. Resident farmers are in a position to guard the structures on their land and also to build and repair them at odd times and use local materials and local labor for such purposes. The outsider is at a disadvantage on all these points. Owners of expensive properties maintain caretakers who stay in the resorts or summer homes during the winter.

In the study made some 10 years ago 25 "farm-resort" enterprises were noted in Oneida and Vilas counties operating 102 cottages. This was a surprisingly small percentage of the total rentable cottages in these two counties. The present study has not revealed any trend toward more farm resorts in this region. Table II shows that of the 105 farms in one of the best recreational areas only 12 reported any income from renting cottages. The chief reason for this is that only a few farms of the 105 were situated so as to qualify as farm resorts. Location on a good lake or stream is the first essential and the value of riparian land suitable for recreation is so high that if the farmer owned any good lake frontage, he would find it to his advantage to sell it to summer home buyers or to speculators who plat the frontage. Sometimes the owner abandons farming to become a resort-owner-operator himself. This was specially important during 1924 to 1927 when over 8,000 lots were platted in Vilas, Oneida and Forest counties or more than half of the lots made available from 1902 to 1930.[8] In the second place, lands near the northern lakes are usually sandy, marshy, stony and often unfit for farming purposes, or if the soil is good the farmer may clear the tract to the water's edge, later to find that the site would have been more valuable for recreational purposes. It was this danger that invoked the restriction of agriculture in recreational districts through zoning. In the words of the Langlade County ordinance, "Such properties demand the maintenance of a maximum of natural conditions to retain their fullest economic value."

Farm resorts appeal to some recreationists, especially those with children, who enjoy the farm animals and like to watch farm operations. Some of the grown-ups "pitch in" to help with the

[8] Bulletin 422, *op. cit.* During the boom riparian land was sold by land dealers as high as $25 a foot of lake frontage and prices of $8 and $10 were common. Of course, the owner who sold the land to the dealer did not receive such prices.

chores! On the other hand, most farmers do not want to bother with children and find the demands of their "guests" irksome. Agricultural work and catering to tourists clash; both come at the same time and the proprietor must make a choice of either the farm or the resort with one predominant and the other distinctly secondary or omitted entirely. Likewise some of the commercial resorts which make no pretense at farming may have a vegetable garden and keep a few cows and chickens. It was noted above that 10 resort owners and one summer home owner had their own cows.

For comparison with the "regular" farmers, 18 schedules were obtained in Oneida County and in counties in northwestern Wisconsin from resort farmers regarding their sources of income. The sample is too small for adequate comparison, but a larger proportion seemed to have income from dairy, eggs, poultry, fruits and vegetables than the regular farmers. The chief difference lies in the much larger proportion having incomes from recreational sources connected with the land they own,—renting cottages and boats, selling ice and "commercial enterprises."

Recreation as a Source of Outside Income for Farmers

The third connection farmers have with recreation is that this "industry" offers opportunities for employment off the farm. These are indicated in Table II but the proportion of all farmers of

TABLE II. PERCENTAGE OF FARMERS REPORTING INCOME FROM A GIVEN SOURCE
(105 regular farmers in the Three Lakes-Minocqua Areas and 18 farm resorts located in Oneida and northwestern Counties of Wisconsin) [a]

Farm Income	*105 regular farmers*	*18 farm-resorts*
Dairy products	64%	83%
Cattle sales	21	11
Eggs	23	39
Poultry	12	28
Other livestock	7	11
Potatoes	42	33
Other field crops	8	0
Fruits and vegetables	31	61
Forest products	9	11
AAA payments	64	[b]
Other	4	6
Recreational Income from Farm		
Cottages	11%	100%
Boats	3	33
Ice	6	6
Commercial [c]	7	22
Other	2	6
Outside Income		
Work at resorts	6%	0%
Guiding	4	6
Pension	9	0
Relief	8	11
Other [d]	55	17

[a] The northwestern counties are Washburn, Burnett, Barron, Polk and Sawyer.
[b] Data not available for the northwestern counties.
[c] "Commercial" includes taverns, restaurants, stores, filling stations, etc.
[d] "Other" includes day labor, mechanic, carpentry, trapping, sale of bait, school bus driver, "town work," mail carrier, preacher, store, keeping boarders and aid sent home by grown-up children.

both types working at resorts or guiding is very small, partly because such employment interferes with work on their own farms or "resorts" during the summer. Caretaking on estates and summer homes during the winter is a very good source of income where the farm family is willing to assume the responsibility and has the reputation in the community for honesty and integrity. The duties of a caretaker range from simply "keeping an eye on the property" while the owner is gone to acting as caretakers and grounds keepers during the summer. There are also opportunities for farm children working at resorts or in stores, etc. during the "season" but no factual data were gathered on this phase of the employment problem.

Recreation Districts

The recreation districts of the northern counties seem to be chiefly concerned with prohibiting agriculture, but it must be emphasized that legally the ordinances prohibit *all* forms of land uses except 10 to 12 enumerated forestry, recreational, mining and hydro power uses, but permit year-long residential occupancy. Recreational uses are desirable uses in the eyes of local people and the trend is in the direction of converting farms into "resorts." For instance, the study of nonconforming users of Langlade, Oneida and part of Vilas County showed that 1/3 of the discontinued non-conforming agricultural uses of Oneida County were "discontinued" by being converted into summer homes and resorts thereby making them "legal uses" in a forestry district. A check on violations of the zoning ordinances of these three counties indicated 42 violators within the area surveyed; all but one occurred in a forestry district. The significant fact in this connection is that a large proportion of the new settlers are not full-time farmers. About half depend upon some phase of the recreation industry for part or all of their income, 12 having summer cottages for rent; 3 have some income from taking care of summer homes, guiding and similar employment, but all of them were year-long residents. That farming was not their major occupation is indicated by the fact that only 9 reported any cultivated land exclusive of hay, and 8 of these had less than 5 acres in cultivation; in fact 18 of the 42 illegal nonconforming users had no income from the land which they occupied—for them it was just a place to live.[9]

The fact that the new residents and violators of the zoning ordinances are people connected with the recreation industry who do a little farming and not *agricultural settlers* is revealing. Local people seem to be tolerant of such "violations" unless *excessive* costs for schools and roads are involved; ordinary costs are expected to be recovered in the increased taxes anticipated from the settlers. Had these settlers located their homes in a recreational district, at least the 18 who were not using the land for farming would have been legal land occupiers. This experience with residential "recreational" settlement in restricted areas raises the question whether the boundaries of the forestry districts should not be modified either by changing the area to a recreational district or leave it unrestricted.

Agricultural Land Uses in Recreational Districts

Recreational zones were set up ostensibly to protect the aesthetic values of riparian land since it was believed that

[9] From unpublished data from the cooperative survey made by the Wisconsin Experiment Station and the Bureau of Agricultural Economics.

agriculture and recreation were incompatible. Farmers sometimes cleared the woodland down to the lake itself, thereby destroying the wilderness aspect of the lake. Agricultural clearing also was responsible for many forest fires and the owners of valuable summer homes and resorts welcomed any restriction which would reduce the fire hazard. Not emphasized at the time zoning was inaugurated, but important nevertheless, are the facts that keeping a heavy forest cover around the lakes will prevent erosion and consequent siltation of the lake, and prohibiting riparian farms will prevent pollution and keep away the odor and sounds incompatible with the quiet and rest desired by recreationists.

A part of the recreation study was directed toward discovering the opinions of resort owners, summer home owners and guests as to these questions. They were not unanimous in favoring a completely wooded shore; about 16% said they would prefer occasional openings because they thought that this would bring better air circulation and drive away the mosquitoes. The recreationists of the Vilas-Oneida-Langlade area were more in favor of a complete forest environment than those who spent their vacation in northwestern Wisconsin. This seems to indicate that there are regional differences in the desires of tourists. Almost 2/3 of the replies indicated that they did not object to farm buildings being visible from the lake but almost 3/4 objected to livestock having access to the water. However, the answers indicated that the *kind* of farm buildings would have much to do with their answers; structures out of harmony with forest surroundings would not be welcomed. The criterion might well be applied to boat houses, hotels, cottages and other buildings not connected with farms at all, and built by the "recreationists" themselves.

Since recreation is the "highest" form of use for riparian land and forested shores are more valuable if left undisturbed than if logged or used for farming, there appears to be little danger that lake shores will be cleared. This no doubt influenced the answers of the people interviewed. Almost none of them feared despoliation in the near future and only a few believed that control of timber cutting is necessary. Nevertheless, examples of clearing had been numerous enough to induce those in charge of zoning to insert the "explanation" for the restriction of agriculture in recreation districts in 9 county ordinances. However, "forest industries" are among the permitted uses in the recreation as well as the forestry districts. "Forest industries" are defined in the ordinances as "the cutting and storing of forest products, the operation of portable sawmills and planer, the production of maple syrup and sugar." Thus in neither district is there any restriction on "clearing down to the water's edge" by loggers and lumber companies or any other land owner. The difference between logging and clearing for agriculture is that in the former there is opportunity to restore the forest cover by natural regeneration, in the latter there is not. It seems that the only consistent and practical way to maintain forested conditions around the lakes would be to restrict or even prohibit cutting on riparian land irrespective of ownership or "land use." The farmer, timber land owner, or recreational land owner should be placed under the same regulations if the amenities of riparian land are to be preserved.

Aside from fire hazards and danger of despoliation the mixture of agriculture

and recreation is not necessarily incompatible, in fact they are often hard to separate. As noted before, some resorts have gardens and provide their own eggs and milk supply. It is doubtful if local people would call this a violation of the zoning ordinance. The Koochiching County, Minnesota, ordinance recognizes this situation by setting up a "limited district" for its recreational area. Commercial agriculture is excluded but gardens or tracts of less than one acre are permitted.[10]

Zoning Land for Recreation

The difference of opinion as to the kind of landscape the tourist wants is an indication that tourists are not at all alike in their standards of what recreation is. Some want the wilderness; and the deeper into the woods and the farther from "civilization" they can get the better they like it. The majority, however, are not of this type. They prefer a mixture of the "tame" and "wild" and the friendly farmstead is not obnoxious; but not many would want a farmstead adjoining their cottage. Still others want a judicious mixture of entertainment places with the hotels and resorts; in fact, many want to be in the center of unrestricted and uninhibited "amusements."

Questions directed at resort and summer home owners and guests as to whether they disliked to have taverns and night clubs near them brought out the fact that 88% did not want them near, whereas 12% had no objections. This opens up the whole question of amusement places and their location, regulation and control, which is beyond the scope of this paper. Ample power and authority for regulation rest with local officials who license taverns and night clubs and who are entrusted with the supervision of dance halls and other places of amusement, but it is a deplorable fact that the desire to make the most of a short "tourist season" is so strong that most towns and counties run these affairs on a "wide open policy."

There are trends in public opinion, however, which indicate that people are ready to go beyond the simple regulation of the present form of recreational districts. Perhaps one of the first steps might be the recognition of different types of recreation and the setting up of standards and regulations for each type. Strictly speaking, there is no legal place for taverns, night clubs, dance halls, stores or any other commercial establishment in either forest or recreation districts today; they are, like farming, *not* among the enumerated permitted uses. Yet they are found in abundance in these districts and usually nothing is being done to prevent new ones from being established in spite of the fact that they are violations of the zoning ordinances.

In densely built-up recreational areas in and near cities and villages, districts might well be set up in which such establishments have a legal status and be so grouped and located so as not to interfere with resorts, hotels, and commercial cottage development. If the lot sizes are made large enough, set-back lines provided and the state and local laws already on the statute books enforced, there need be no objectional features connected with such districts.

At the other extreme, one can assume a lake where all such features would be eliminated. This would not need to be a wilderness with only a cabin or two

[10] "No land in excess of one acre shall be used by any person or family for the production of field or truck crops, livestock or livestock products." Cf. William F. Musbach and Melville C. Williams, "Rural Zoning in Minnesota," *Journal of Land and Public Utility Economics*, February, 1940, p. 108.

on the entire body of water, but might well be a completely platted area surrounding the entire lake. Although platting the property would mean submission of the plan to the State Planning Board for approval, nevertheless a restricted district could be set up by a zoning ordinance which would embody all the restrictions set up by the State Board of Health and the State Planning Board and go beyond the ordinary legal requirements. The Conservancy Districts of Jefferson County are a case in point.[11]

The private deed restrictions required by some of the companies in the north will illustrate what might be done by zoning. On one such lake the land has been laid out in a single plat with practically all the lots running from a road to the high-water mark, thus giving each lot access to transportation and to the lake. Most of the lots are over an acre in size. The deed restrictions prohibit the purchaser from subdividing the property conveyed to him, and he may not remove any green timber except for the site of the buildings. No barns are to be built and no animals or poultry are allowed except dogs and household pets. By these covenants the cutting of timber within the platted area is prevented and the wilderness appearance of the lake is maintained; agriculture is automatically eliminated. The provision that "no hotel, apartment house, store, saloon, theater, commercial kennel, commercial garage, filling station, or other manufacturing or mercantile establishment or any building detrimental to a first class neighborhood and no residence designed for the use of more than two families shall be placed, built, erected or maintained," prohibits every form of land occupancy except one or two family private residences.

The wilderness landscape is preserved also by the stipulation that no building shall be erected closer than 35 feet from the high-water mark and the house must be at least 15 feet from the side or rear lot lines. "No boat house shall be built nor any other buildings nor anything else that might obstruct the view of the lake unless such location be approved in writing by the grantor." In fact, plans and specifications of *all* structures must be approved by the grantor before they can be built, thereby giving him full architectural control. Piers cannot exceed twenty-five feet in length, unless approved by the grantor and all signboards of any character are prohibited along the shore line or "any part of the property conveyed" unless approved by the grantor. Outside toilets are not permitted, chimneys must be protected by wire net spark arrestors and bonfires or camp fires must be properly and carefully guarded.[12]

It will be noted that these restrictions are designed to protect the amenities of the lake and its frontage in a most admirable manner. All incompatible land uses are excluded from a strip of land from ⅛ to ¼ of a mile from the lake. Even though all the land beyond this strip were cleared the lake would still have the appearance of being surrounded by a primeval forest. The man-made aspects are hidden in the woods by the 35 foot set-back from the lake and kept at a minimum by the restrictions on boat houses and piers.

Restrictions on such a riparian strip with the land beyond left open to agriculture is ideal from the standpoint of a

[11] J. M. Albers, "New Uses for County Zoning: The Jefferson County, Wisconsin, Ordinance," *Journal of Land and Public Utility Economics*, November, 1938, pp. 460-462.

[12] As recorded in the office of the Register of Deeds of Vilas County, Wisconsin, Sept. 9, 1929.

dual farm-recreation economy. Farmers would be near enough to summer home owners to supply them with farm products. There is nothing to prevent nearby farmers from buying lots on the lake to build cottages or summer homes for rent as long as the buildings meet all the deed restrictions. Likewise, taking care of the summer homes, boat houses and other part-time employment would be available to the neighboring farmers.

In a plan for recreational land several types of districts would be desirable, ranging from districts similar to commercial or business districts of a city, designed to accommodate hotels, resorts, dance halls and taverns, to districts comparable to "high class" residential areas. The Conservancy Districts of Jefferson County are an example of the latter. In between, there might well be other types of districts differing in the land uses and the severity of restrictions and regulations. This may seem unusually complex for a rural "wilderness" area but there is evidence that many summer home and resort owners would like to see more restrictions rather than less to safeguard and enhance the health, morals, safety and general welfare of the community in which they and their families and guests spend the summer. Being urban residents, most of them are familiar with zoning and its purposes, but being non-residents of the town and county in which these summer homes or resorts are situated they are non-voters there. One of the problems in connection with zoning, or any other governmental functions of concern to the recreationist, is the fact that, although he is a land owner and tax payer, he is generally not a voter nor is he present in the town or county when elections are held or the county board of supervisors holds its regular meetings. Both reasons exclude him from direct participation in local government.[13]

In addition to zoning and promoting the better use of privately owned recreational land a complete plan should include publicly owned recreational land —forests, parks, recreational highways, waysides, beaches and hunting grounds. This phase of land use planning, however, is beyond the scope of this article.[14]

[13] An interesting recognition of this fact is found in the law prescribing the procedure of incorporaing villages. In territory used principally for tourists or summer home purposes where more than one-half of the area is owned by non-resident non-voters, incorporation is not permitted unless the majority of the non-resident owners sign a petition consenting to the incorporation. (Wisconsin Statutes #61.01)

[14] Cf. for instance, "A Recreational Plan for Vilas County," Wisconsin State Planning Board, *Bulletin #12*, Jan. 1941.

Inland Waterway Carriers

By HAROLD KELSO*

WHO gets the benefits? This has been the question of growing urgency which characterizes recent discussions on inland navigation. The controversy over the inherent economy or wastefulness of improved waterways continues; but the supporters now have the forensic advantage of a *fait accompli*—the canalization of all major rivers is nearing completion. The newer skepticism is typified by the complaint of Senator Burton K. Wheeler, chairman of the Senate Interstate Commerce Committee:

> "In the shipment of gasoline and the shipment of cement and the shipment of steel, all of these companies, notwithstanding the fact that they ship by water, do not charge the water rate; they charge the railroad rate to the consuming public. . . . The people making those shipments pay nothing for the use of the waterways that they use, but the Government pays for that and all the taxpayers pay it, yet the consuming public does not get the benefit of it."[1]

Nothing in the Constitution or in natural law prescribes that the only justifiable government expenditures are those which benefit the consumer; to increase pay checks may contribute as much to the general welfare as to reduce grocery bills. Furthermore, the composite judgment of society has consistently approved government services that do not return benefits to each taxpayer in proportion to the size of his tax payments. As a matter of fact, the wisest economist could not devise any public service institution that would be so perfectly adjusted to the conditions of demand and supply for all affected commodities that all the benefit would go to the consumer, or all of it to the producer, or all of it be rationed in proportion to individual tax payments. In short, there will inevitably be some grounds for dissatisfaction with the incidence of costs and benefits in any subsidized enterprise.

The Test of Diffusion

It may be assumed, however, that a widespread diffusion of the private economies possible in inland navigation is desired by the advocates of improved waterways. In law, the rivers are public highways; subject to certain police regulations, anyone who wants to can float his own vessels. The fact is that an efficient river fleet is sufficiently expensive to discourage universal use of the channels provided.

Only a few enterprises have direct access to a waterway or sufficient traffic to justify investment in modern towboats and barges that would be used exclusively for their own cargoes. A few industrial centers can supply enough tonnage to support contract carriers who will handle shipments for several firms. A contract carrier, however, will rarely find it worth while to solicit the traffic of an ordinary shipper of occasional carload lots, much less to offer dependably regular less-than-carload service. Waterway benefits to the small firm obviously depend on the existence of adequate common carrier transportation lines. Furthermore, if any direct benefits from inland navigation are to be extended to firms that are not located near a waterway, there must be through routes and joint rates between river carriers and rail-

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[1] U. S. Congress, Senate Committee on Interstate Commerce, *Transportation Act of 1939, Hearings* . . . (1939), 576; Cf. U. S. Federal Coordinator of Transportation, Section of Research, *Public Aids to Transportation*, (1939), 3:99-113.

roads or trucks. Payment of local freight rates to and from the river terminals would otherwise tend to absorb the economies of water transportation.

The classification of inland barge lines into private, contract and common carriers can be only approximate. Until recently, a private carrier might deliver its own products in its own barges and also contract with other firms for traffic without legal restriction. A common carrier, offering regular service to all at published rates, might also contract with some firms for traffic at special rates. It is yet too early to predict whether the Transportation Act of 1940 will seriously modify this situation.[2]

One basis for the prevalent impression that inland waterways are useful primarily to the larger business enterprises is given by an analysis of the types of service available, as presented in Table I.

TABLE I. TYPES OF CARRIERS ON MISSISSIPPI RIVER SYSTEM AND NEW YORK BARGE CANAL[a]
(Fleets of Five or More)

Type of Carrier	N. Y. Barge Canal, 1940	Mississippi River System, 1936
Private	1	59
Private and contract	3	22
Contract	24	19
Contract and common	3	6
Common	3	7

Source: U. S. War Department, Corps of Engineers, *Transportation Lines on the Atlantic, Gulf and Pacific Coasts* (1940), 155-7; same, *Transportation Lines on the Mississippi River System* (1936), 74-111.

[a] Because of the mingling of ocean with inland lines in the data, it is impossible to compile similar analyses for the intracoastal waterways.

The numerical preponderance of private and contract carriers is only indicative but not decisive as to the incidence of benefits from inland navigation. Adequate service to the smaller shipper (or consignee) does not require numerous common carriers. Given efficient and fair operations, all that is necessary is that each waterway should have at least one.

[2] See *infra*, pp. 87-92.

Private Carriers

Private carriers are usually operated as a department of the corporation that owns them; they are profitable through their effect on costs and not because of any direct income which they may produce. No official agency compiles data in which the operations of these carriers are adequately segregated. The most recently published official estimate of their importance in carrying freight was made by the Chief of Engineers of the United States Army in 1932, when 88 percent of the tonnage on the Ohio and 30 percent on the Mississippi were ascribed to private carriers.[3] Though tonnage figures are less representative of the extent of waterway use than ton-miles, such percentages, coupled with the names of a few of the mammoth corporations that own river fleets, give some basis for the charge that inland navigation channels represent a subsidy to big business.

Actually, a check of the names of river transportation lines with mercantile credit ratings, investors' services and similar sources of corporate financial data leads to the conclusion that probably less than twenty firms that own river fleets are capitalized at five million dollars or more. Any extra economies to these firms in inland navigation may be ascribed in part to large-scale production rather than to the fact that they use the publicly maintained channels. The vessels of comparatively small firms can and do use the rivers as well.

Private carriers on the Mississippi system list over one hundred "principal commodities handled."[4] The variety is

[3] *Ibid.*

[4] U. S. War Department, Corps of Engineers, *Transportation Lines on the Mississippi River System* (1936), 74-111.

great enough that transportation savings are undoubtedly widely diffused. The direct beneficiaries are the firms that own plants or warehouses near a waterway. Presumably these enterprises invest in river-front and floating equipment with the intention of adding to their own net profits, but some filtration of benefits to other interests probably occurs. The more profitable a firm is, the more money it spends for taxes, payrolls, capital equipment and inventories; also the more amenable it is to competitive and regulatory pressures to reduce prices. The importance of these considerations will be estimated differently by different critics, but it is significant that no one has yet tried to justify the federal waterways program entirely on this basis.

Contract Carriers

To become going concerns, contract carriers obviously have to build up a backlog of traffic from regular customers. Beyond this necessity, there have been no limits on rates and services except bargaining power. Different rates may be charged for different lots of identical merchandise carried on the same vessel between the same termini. The lines are privately financed. Except for an issue of equipment trust certificates by one company, none of the contract carriers makes any public offering of securities, so that their financial condition is not a matter of public record. The major trade association of these barge lines does not even have operating statistics on its own members.[5]

If one of the representatives of a contract carrier pauses in the pursuit of traffic long enough to express any economic philosophy, he will organize his ideas around the concepts of competition and cost-of-production. His firm does not need to be regulated, he argues, because if his rates are too high, some competitor will get his business. The common-carrier idea does not fit the waterways; it is high-cost transportation. A single barge will carry an entire train-load; its ratio of dead-weight to pay-load is 1:5 as compared with 1:2 for the train. Obviously the truly economic function of the barge-lines is large-scale transportation of bulk commodities at rates that will return a fair profit over cost—waterway cost. Regulation would tie his rates differentially to those charged by the railroads, and there is no connection whatever between his costs and rail rates. Sometimes he can make a profit charging a third of the rail rate; sometimes he could not make any profit it he could get the full rail rate.

This paraphrase of the contract carriers' inchoate economic theory does less than justice to the vehemence and sincerity with which these lines fight back at their detractors. Most railroad applications to the Interstate Commerce Commission for permission to reduce rates to meet water competition have arisen from situations in which contract carriers were cutting in on rail traffic. The common carriers by water likewise consider contract carriers by water to be troublesome competitors. The necessity to maintain service for all at the same terms on regular schedules between fixed terminals handicaps either a rail or waterway common carrier, if it must compete with an agency that is able to choose profitable and shun unprofitable traffic on terms that reflect only the opportunism of the moment. The common carriers believe that the practices of the contract carriers are parasitic to dependable, balanced transportation.

The balance of logic between these

[5] U. S. Congress, House Committee on Interstate and Foreign Commerce, *Omnibus Transportation Bill, Hearings . . .* (1939), 1067.

viewpoints swings with one's social philosophy rather than with any objective criteria. It may be suggested that the business functions of the contract carrier are similar to those of the private carrier. It cuts transportation costs for the firms that it serves, without knowing or caring anything about problems of incidence. The firms served are so numerous and varied that one may assume a widespread diffusion of benefits from the cheap transportation which is provided.

Common Carriers

Except for ferries and local packet services, common carriers had entirely disappeared from the waterways by 1900. Their renascence was impelled by the war-time glut in transportation, when the federal government established fleets under the Railroad Administration to operate on the New York barge canal, the lower Mississippi River and the Warrior river system. The war was over before the federal barge lines could be built up to carry a significant volume of traffic, but experimental operation of the government's fleet continued under the Inland and Coastwise Waterways Service of the Department of War. Reorganized in 1924 as the government-owned Inland Waterways Corporation, the federal barge lines now serve the Illinois, Missouri, Mississippi and Warrier rivers.[6]

If an ordinary vertical bar chart were constructed to compare the assets of the Inland Waterways Corporation with those of America's Class I railroads, and the scale chosen were 1 inch = $100,000,000, the bar for the federal barge line would be ¼ inch and the bar for the railroads would be 27 feet high.[7] The fury of the railroads against this enterprise is therefore all out of proportion to its size. The reason is that this government corporation is a dynamic force in encouraging transportation not only over its own lines but on rivers and canals in general. It has initiated most of the litigation to force railroads into through routes and joint rates. It has financed some of the most important research on floating and terminal equipment. Only the army engineers have been more diligent in preparing analyses of waterway economics for presentation to Congress. The results have been a growth of traffic not only for the Inland Waterways Corporation but for all barge lines, private and contract as well as common carriers. In fact, the percentage of total freight carried by the federal barge lines on the channels they serve has been gradually declining. These trends are indicated by Table II.

The average haul of a common carrier barge line is characteristically much longer than that of private and contract carriers. In 1938, for example, the average haul of the Mississippi division of the Inland Waterways Corporation was 869 miles, but for all carriers on the Mississippi river it was only 236 miles.[8] This difference reflects basic distinctions between the services rendered. A substantial portion of the cargo of a common carrier is general merchandise; almost all of the cargo of most private and contract carriers is usually bulk commodities. Several hundred shippers and consignees may be served by a single trip of a common carrier; only a few (often just one) will be served by the others. Common carriers that have joint rate agreements with railroads are handling a growing volume of traffic from and to firms that

[6] Service on the New York canals was discontinued shortly after the World War.

[7] Based on reported assets, December 31, 1940: Inland Waterways Corporation, $25,061,000; Class I railroads, $32,168,867,000.

[8] *Annual Report of the Chief of Engineers, U. S. Army*, 1939, part 2, pp. 1366, 1447. The sections covered are not quite conterminous, but the resultant error is not significant.

TABLE II. TOTAL TON-MILES AND INLAND WATERWAYS CORPORATION TON-MILES ON CHANNELS SERVED BY THE CORPORATION, 1929-1940*
(,000 omitted)

Year	Mississippi Division			Warrior Division		
	Ton-Miles[a]	I. W. C. Ton-Miles	Percent	Total Ton-Miles[b]	I. W. C. Ton-Miles	Percent
1940[c]	6,138,347	1,715,470	27.94	610,043	177,355	29.07
1939[c]	5,598,473	1,642,286	29.33	563,443	148,787	26.41
1938	5,346,835	2,224,019	41.60	532,950	185,234	34.76
1937	4,326,295	1,681,215	38.86	541,301	156,721	28.95
1936	3,835,482	1,522,888	39.71	366,643	117,807	32.13
1935	3,371,062	1,406,832	41.73	339,801	92,227	27.14
1934	3,248,824	1,134,826	34.93	290,390	94,455	32.53
1933	3,009,490	1,191,592	39.59	308,597	114,483	37.10
1932	2,979,719	1,232,398	41.36	284,969	118,378	41.54
1931	3,047,994	1,072,851	35.19	[d]	[d]	[d]
1930	2,309,087	1,057,922	45.82			
1929	2,030,136	1,183,674	58.31			

* Source (except as noted): Computed from *Annual Report of the Chief of Engineers, U. S. Army*, 1930-1940, part II.
[a] Consolidation of Mississippi river sections, Minneapolis to New Orleans, 1929-1940; Illinois waterway added, 1934-1940; Missouri river below Kansas City added, 1935-1940.
[b] Consolidation of Black Warrior system and Mobile-New Orleans waterway.
[c] Total ten-miles for 1940 obtained by correspondence from W. E. Graves, Chief Statistician, Board of Engineers for Rivers and Harbors, War Department, Washington, D. C.; Inland Waterways Corporation ton-miles for 1939 and 1940 obtained by correspondence from Guy Bartley, Secretary-Treasurer, St. Louis, Mo.
[d] Comparable data not available before 1932.

are not in river towns; it is rare for the other services to handle commodities that have been or will be shipped by rail without any intermediate storage or processing.

The common carrier, then, has much higher costs than other waterway services. It must maintain a traffic department. It must frequently hire expensive legal assistance in rate cases. It must own or lease terminal equipment not only for specialized bulk cargoes but also for general merchandise. Since it competes directly with the through services of the railroads, it must quickly handle claims for loss or damage, whereas the other services may carry cargo at shipper's risk or under marine insurance paid for by the shipper. During the developmental period of a common barge line, it must frequently make scheduled trips with a light load, and it never builds as favorable a load factor as is enjoyed by efficient contract and private carriers. To meet the speedier and more flexible service of the railroads, the common carrier barge line usually has only one advantage to offer, lower rates.[9] The differential advantage is seldom more than 20 percent; it may be less. The saving to shippers or consignees is not tempting for short-haul traffic unless the tonnage involved is large, and in that case the savings offered by contract carriers, or by investment in a private fleet, will be greater than the common carrier can offer under a policy of equal service to all at equal rates.

Financial and operating statistics are available for only those waterway lines that have maintained joint rate agreements with the railroads, and therefore were required to report to the Interstate Commerce Commission. All reporting carriers combined have shown losses in recent years more often than they have shown profits. Because of the operation of both ocean and inland waterway fleets

[9] Sometimes the slower barge service also offers a substitute for storage.

by some coastal carriers, complete analyses of barge operations throughout the country cannot be compared. Mississippi system carriers have usually shown better operating results than coastal barge lines, probably because of the longer hauls available to them. Long-haul traffic does not use the intracoastal waterways to any great extent; it takes to the open ocean in heavy-draft vessels. Table III shows that even in the Mississippi valley area, profits have been moderate and the mortality of individual firms has been high, although the total assets of the surviving lines have been growing.

Thus meagerly rewarded, the common carrier barge lines do extend to small firms at least some of the benefits of inland navigation. As a matter of public policy, this raises a neat question: Since a railroad's right-of-way expenses are usually about one-third of its operating income, and the savings extended on common carrier water transportation are seldom more than 20 percent, can the diversion of traffic from rail to river possibly result in any net social advantage? The obvious answer is, No. But the obvious answer rests on dubious assumptions. Inductive evidence can be piled up to any desired degree that the active interests behind river and harbor development have represented dominantly those enterprises that would be served by private and contract carriers.[10] Under this impetus, navigable channels have been provided. The incremental cost to the government of floating the common carriers' barges on the channels is almost nothing—only the expense of an occasional extra lockage. Remove the common carriers, and the federal cost for river and canal improvements would become entirely a subsidy to the larger and presumably more monopolistic business enterprises. Even these would not benefit unless they were located near a waterway. It has already been shown that under such circumstances the expenditures might still be defended, but the defense would be weaker than if some

[10] This statement rests on an examination of numerous volumes of *Hearings* before the Rivers and Harbors Committee of the House of Representatives, plus an analysis of the estimated benefits from recommended improvements as reported in the project documents of the army engineers.

TABLE III. EARNINGS OF MISSISSIPPI VALLEY COMMON CARRIER BARGE LINES REPORTING TO INTERSTATE COMMERCE COMMISSION, 1929-1940*

Year	Carriers Reporting	Net Invested Capital	Net Income	Percent Return on Capital
1940[a]	3	$20,655,652	$ 481,450	2.33
1939[a]	3	20,744,885	652,713	3.15
1938	8	20,214,754	1,538,052	7.61
1937	9	20,296,013	463,034	2.28
1936	10	19,961,846	728,634	3.65
1935	11	19,023,958	795,435	4.18
1934	8	17,224,775	—741,749[b]	—4.31[b]
1933	11	18,750,487	201,166	1.07
1932	10	18,380,080	618,064	3.36
1931	12	5,226,221	229,968	4.40
1930	14	5,936,600	—159,541[b]	—3.02[b]
1929	15	2,889,153	— 92,365[b]	—3.20[b]

* Source (except as noted): U. S. Interstate Commerce Commission, *Statistics of Railways in the United States*, 1929-1938. Last column computed.
[a] Data for 1939 and 1940 obtained from M. O. Lorenz, Director of Statistics, Interstate Commerce Commission, Washington, D. C., by correspondence.
[b] Loss.

direct benefits from inland waterways were more widely diffused.

The Transportation Act of 1940

Port-to-port operations of common and of some contract waterway carriers will be regulated by the Interstate Commerce Commission under the Transportation Act of 1940.[11] The Commission's authority will extend to all phases of control over waterway common carriers, including the issuance of certificates of convenience and necessity, prescription of maximum, minimum or exact rates, supervision of accounts, and regulation of security issues. Exempted from regulation are ferries, tankers, private carriers and contract carriers that do not transport more than three bulk commodities at any one time.

The new legislation does not touch three complaints that have been made by the railroads; namely, that waterways themselves are furnished at public expense while the railroads must furnish their own rights-of-way, that the principal beneficiaries are large corporations who do not need government aid, and that in the Inland Waterways Corporation the government is subsidizing a line-haul carrier at a saving to shippers which results in a weakening of railroad transportation by uneconomic competitive reductions in rates. The original draft of the Act contained provisions that were designed to meet these complaints: Tolls were to be charged on improved inland waterways; the commodities clause was to be extended to barge lines, so that a corporation would not be permitted to carry its own merchandise in its own vessels if it did any common on contract carrier business; the federal barge lines were to be liquidated. These provisions were defeated in committee.

The hypothesis that any kind of water transportation really hurts any kind of land transportation has been studied so far only by analysts, pro and con, whose obvious self-interest casts suspicion on their findings. A Board of Investigation and Research has been appointed under the new Act, and one of its functions will be to study this problem. If subsidized waterways are crippling the railroads, few will doubt that it is the railroads which should have first claim to public favor. If it can be demonstrated that the superior service of the railroads enables them to hold their own against the slower, less flexible waterway carriers, then it would seem to be in the public interest to encourage a wide diffusion of the private economies possible in barge transportation, to offset the billion dollars that the federal government has spent to improve rivers and canals.

Congress, to quote from the Act, has declared its policy "to provide for fair and impartial regulation of all modes of transportation . . . so administered as to recognize and preserve the inherent advantages of each." The phrase "inherent advantages" as applied to waterway transportation is presumably to be interpreted against the present background of toll-free channels improved at government expense, since the Interstate Commerce Commission is given no voice on policies affecting the channels themselves. If present conditions, reflecting past evolutionary adjustments, are any guide, most of the "inherent advantages" of inland navigation will be found to accrue directly to two classes of shippers, the large river-bank industry that can supply thousands of tons of short-haul traffic

[11] Public No. 785, 76th Cong., 3d Sess. Legislative histories and more detailed summaries of this Act are given by A. L. Stein, "Federal Regulation of Water Carriers," *Journal of Land and Public Utility Economics* 16:478 (1940); Ralph L. Dewey, "The Transportation Act of 1940," *American Economic Review* 15:31 (1941).

every year for its own or hired boats, and the smaller shipper of those classes of extremely long-haul traffic that do not have to be delivered in a hurry. The difficulty of obtaining back-haul cargo will probably keep either private or contract carriers from becoming a dominant part of long-haul waterway transportation; that field will be held, for the most part, by the common carrier whose regular schedules build the habitual acceptance of waterway routings into the consciousness of a large number of shippers. To these conclusions there are exceptions: Long-haul tank barge transportation of petroleum products will continue to be handled by private carriers; an occasional contract carrier will be able to find profitable cargoes in both directions between distant termini; under special local conditions, short-haul common carrier service may flourish. These exceptions do not disprove the rule.

The broad exemptions of the Transportation Act of 1940 leave at least half of river traffic, measured by tonnage, still unregulated. The Interstate Commerce Commission has been given a big job; then one of its arms has been tied behind its back. As a minimum expectation, the new powers represent merely an inch of progress toward a unified transportation system for the United States. As a maximum potentiality, the experience of the Commission in its present limited province may clarify the principles that should be written into future legislation that will provide more adequate controls.

The Intent of Congress

In form, merely a question of fact is involved in the query: Who gets the benefits? In substance, the implication is a question of policy: Who should get the benefits? On questions of policy, the answers must be furnished by Congress.

Regarding one type of waterway improvements, those designed primarily for flood control, Congress has left no doubt as to its attitude on the incidence of costs and benefits. In a section labeled "Declaration of Policy," it has said:

". . . the Federal Government should improve or participate in the improvement of navigable waters or their tributaries, including watersheds thereof, for flood-control purposes if the benefits to whomsoever they may accrue are in excess of the estimated costs . . ."[12]

The implied philosophy is that a federal project which creates benefits greater than costs is justified, even if the benefits accrue to groups who do not pay the costs. In relation to flood control, the humanitarian appeal supports the validity of such a policy.

A "declaration of policy" on waterway improvements for navigation has never been made, but the instructions of Congress to the Board of Engineers for Rivers and Harbors contain this sentence:

"And in the consideration of such works and projects the board shall have in view the amount and character of commerce existing or reasonably prospective which will be benefited by the improvement, and the relation of the ultimate cost of such work, both as to cost of construction and maintenance, to the public commercial interests involved, and the public necessity for the work and the propriety of its construction, continuance or maintenance at the expense of the United States."[13]

"Public" is the doubtful word in these instructions. This provision has been in the law for more than a generation, however, and under it the board has made nearly 5,000 investigations.[14] Largely on the information supplied by these inves-

[12] *United States Code* (1934 ed., Supplement V, 1939), Title 33, Section 701a.

[13] *United States Code* (1934 ed.), Title 33, Section 541.

[14] *Annual Report of the Chief of Engineers, U. S. Army, 1940*, 1:23.

tigations, Congress has spent billions of dollars on river and harbor improvements. No substantial evidence is found in the project documents of the army engineers, the hearings before the House Committee on Rivers and Harbors, the reports of the committee to Congress, or the debates in Congress, to indicate that the policy of Congress in developing a waterway for navigation is any different from that involved in developing it for flood control. If the benefits, "to whomsoever they may accrue," are considered greater than the costs, the projects are approved.

In exempting all private carriers and those contract carriers that transport three or fewer bulk commodities from regulation under the Transportation Act of 1940, Congress in effect reaffirms this policy. No interference is contemplated with the larger users of the waterways, whether their savings are passed on to the general public or not. A solicitous regard is extended, however, to the common carriers, who wanted to be regulated, and wanted the contract carriers to be regulated, too.[15] The only carriers who did not get what they wanted were the small contract carriers, operating on an "anywhere for hire" basis, setting rates to get the traffic, sometimes regardless of even their own long-run well-being. It might be inferred that Congress does not want to remove any waterways benefits from big business. The aim seems to be to stabilize the barge lines at the other end, to extend similar benefits as widely as possible to little business.

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[15] U. S. Congress, Senate Committee on Interstate Commerce, *op. cit.*, 589, 697; U. S. Congress, House Committee on Interstate and Foreign Commerce, *op. cit.*, 1177, 1225.

Adjustment of Population to Rural Resources in Missouri

By C. E. LIVELY*

THE relationship between population and land is of fundamental importance. In a self-sufficient agricultural economy, this relationship is generally simple in nature; but in the modern urbanized and industrialized economy this relationship becomes exceedingly complex. The influence of powerful factors, often non-agricultural in nature, is reflected in the standards and practices determining the use of land and other natural resources. Trends and differentials in birth and death rates, which within limits are culturally conditioned, affect the distribution of population upon the land. Policies arising out of need for national defense, or through desire to wage war, tend to transform the aims of society from that of economic utilization of natural resources for the support of the population to that of utilization of resources (economically or otherwise) for the purpose of winning the conflict. There is great need for a clearer understanding of the significance and inter-relationships of these and other forces operating to determine what use shall be made of land and other natural resources. This article sketches some of the major trends of population in the state of Missouri and is intended to contribute to that end.

According to the U. S. Census of 1940, the population of the state of Missouri now includes more than three and three-quarters million persons.[1] In 1810 the state included fewer than twenty thousand persons but by the Civil War the number had risen to more than a million. The rate of growth was rapid although at a decreasing rate until after the turn of the century when the decennial rate dropped to 6.0%, 1900-1910. Since 1900 the decennial rate of increase has averaged a little more than 5%. Not since 1870 has the decennial rate of population increase been equal to that of the United States as a whole.

In 1940 a little more than half (51.8%) of the population of Missouri was classified as urban. The urban population has grown from a little more than half a million in 1880 to nearly two million in 1940. This urban growth has been largely the result of the growth of two cities, St. Louis and Kansas City, for two-thirds of the urban population of the state lives in these cities. Only one other place is as large as seventy-five thousand. Because of this high concentration of urban population in a few spots, Missouri is far more rural in its social organization and atmosphere than might be inferred from the rural-urban division of population. Most of the counties may be termed rural. In 1930, 85% of the urban population lived in thirteen counties. Of 114 counties, 62 had no incorporated place as large as 2500 and 102 had no place as large as 10,000.

The rural population of Missouri reached its maximum size in 1900 and declined steadily to 1930. In 1940, the rural population was approximately equal to that of 1890. In 1910 the rural-farm component, i.e., the persons actually living on farms was two and one-half times the rural-nonfarm component, consisting of all those not engaged in agriculture but living in unincorporated territory and incorporated villages and cities with fewer than 2500 persons. Since

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[1] The census enumerated 3,784,664 persons.

1910 the rural-farm population has declined relatively until in 1940 it was only 65% greater than the rural-nonfarm component.

Areal Differentials in Population Growth. Missouri possesses a wide variety of physical conditions and resources and this situation greatly affected the course of early settlement. The first settlements occurred along the Mississippi-Missouri river margins and spread out from there. When the state was admitted to the Union in 1821, the northern third plus the entire southwestern portion and the Ozark highlands were, generally speaking, unsettled. As time passed, these areas filled up. Practically all counties gained population prior to 1870. The rural population reached its maximum in 1900 and since that time most of the counties north of the Missouri river and many of the west-central counties have steadily lost population. The deep Ozarks and the southeast Mississippi lowlands were settled last; indeed, the latter area is still in the process of exploiting the wealth inherent in the virgin soil fertility so abundant there, and the economic and social organization of the area still bears the earmarks of a frontier, exploitative society. Barring the small areas immediately tributary to cities of importance, the northern and western agricultural areas have been steadily losing population for 40 years. The Ozark highlands have passed this maximum incident to settlement and the population tends to decrease sharply with the upswing of the business cycle and increase with the occurrence of depression. The southeast lowlands have not yet reached maximum population. In 1910, six of the seven counties of this group had from 20% to 60% of their land in farms. Increase has been rapid since, and during the last decade these seven counties all gained population at rates ranging from 20.2% in Stoddard County to 46.9% in Mississippi County.

Population Fertility and Population Growth. From the point of view of surplus of births over deaths, the population of Missouri is still increasing. If allowance is made for under-registration of births, the crude birth rate is about 17.0 per thousand population. With a death rate of 11.3 in 1939, a natural increase of 5.7 persons per thousand per year prevails. This amounts to a rate of growth of about 6% per decade.

Even the present low rate of natural increase cannot be expected to continue, however. More than ten years ago the population of Missouri would have been at a stationary level had it not been for a favorable age distribution. The index of growth based on fertility ratios was 1.05 for the native white population and 0.70 for negroes,[2] on a scale in which 1.0 indicates a stationary condition. Since that time the number of births has declined still further so that it is probable that the entire state is now producing too few births to maintain a stationary population. With the rapid increase in number of aged persons and the consequent likelihood that the death rate will soon increase, it may not be many years before certain areas of the state will show a larger number of deaths than births.

But if the total population of the state is at a stationary level with respect to natural increase, the urban population is far below that point. Even in 1930, the entire urban population was producing only 75% of the number of births necessary to maintain the population at a stationary level. St. Louis had a 28% deficit of births in the native white population, and Kansas City a

[2] W. S. Thompson, "Standardized Deplacement Indices . . . , by States, 1930 and 1920." *Population Index*, 4 (4), Oct. 1938, p. 270.

37% deficit. The negro population of these cities had approximately a 50% deficit. That there is still a surplus of births over deaths in these cities is due to the fact that the death rate is abnormally low owing to the abnormally large proportion of persons between the ages of 15 and 50, a condition that is common to large cities.

Since 1930, the number of births has declined considerably and, although defense prosperity has increased the number of marriages and consequently the number of births, the upturn in the birth rate is probably temporary. The continuation of migration into these cities is necessary for the maintenance of present numbers, and if the number of births in these cities continues to decline, as may very well happen, the number of deaths will soon balance or even exceed the number of births.

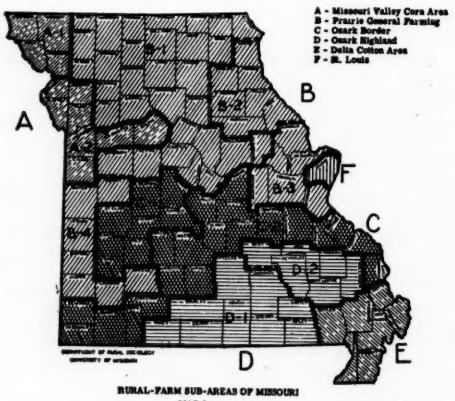
By contrast to the urban population of Missouri, the rural population is still producing enough children to more than maintain its numbers. In 1930, the entire rural population was producing 44 percent more children than was necessary to maintain a stationary level. The rural-nonfarm population was producing a 27 percent surplus. Comparable figures for 1940 are not yet available but the decline in number of births since 1930 makes it certain that this surplus has been cut significantly.

Rural population fertility is by no means uniform throughout the state. In general, the lowest rural birth rates occur north of the Missouri river and the highest birth rates deep in the Ozark highlands. In most counties north of the river the rural population is producing less than a 25 percent surplus of children above the number required to maintain the population at a stationary level. Two counties have a deficit. Most of the counties immediately south of the Missouri river and also those on the western border of the state are producing more than a 25 percent surplus of children. In the Ozark border, most of the counties are producing more than a 50 percent surplus of children above the number required to keep the population stationary, and the rate rises to more than a 100 percent surplus in many of the deep Ozark counties. In 1930, ten of these counties were producing more than twice as many children as were necessary to maintain the population. Thus, if all the children born in these Ozark counties remained there, in a situation which is already overcrowded, the condition would rapidly become intolerable.

In the southeast Mississippi lowlands, the rural population is producing approximately 75 percent more children than is needed to maintain the population. The farm population rates still higher with most of the counties showing a 100% surplus. With no migration into or from this area, the population would increase at a rapid rate. Even so, the recent rapid increases in the rural population of these counties can be attributed only in part to natural increase. Much migration into the area has occurred.

Youth in the Missouri Population. Although the declining birth rate has been steadily reducing the number of children in the population, the full impact of this reduction upon the affairs of the state has not yet been felt. The sharp decline in number of births that occurred during the depression years of the early thirties is just now being reflected as a decline in the enrollments of elementary schools. It will be another ten or twelve years before these children will be offering themselves for the labor market. At that time a decrease of fifteen to twenty percent, as compared with the number of similar age now offering themselves for the market, will be noted.

At present, the largest classes of children in the history of the state, those of 1920-24, are offering themselves for employment. It is fortunate that an upturn in the business cycle has coincided with the occurrence of this large supply of labor. These workers will be active in the labor market for the next twenty-five or thirty years. Missouri normally exports young workers, and had depression persisted, it would have been difficult for many of these workers to find employment. No doubt many would have taken to the open road as others have done before them. This is particularly true of rural youth and especially of those in the areas where the birth rate has been high and resources relatively meagre. Rough estimates of the number of farm-reared youth necessary to exactly replace the losses from the ranks of farm workers resulting from death and retirement, suggest that during the last decade in Missouri nearly twice as many such farm-reared male workers were produced as were needed on the farms. The proportion needed for replacements varied from two-thirds in Area A (Cf. map 1) to 45% in Area E and 40% in Area D. Thus, there was a surplus of farm-reared males during the decade, ranging from one-third in the best agricultural area of northwestern Missouri to a surplus of 60% in the rougher portions of the Ozark highlands. These surplus youth cannot be accommodated on farms without increasing the number of farms, a condition that must be regarded as undesirable in the poorer sections. They must find their way into non-agricultural industry or contribute further to the over-population of these poorer agricultural areas from whence the largest proportion come. With economic prosperity the situation may be expected to improve slightly during this decade because some reduction in number of farm-reared youth of employable age will occur. However, economic depression may easily offset any such gain and more.



RURAL-FARM SUB-AREAS OF MISSOURI
MAP 1.

The Aged in the Population. The increasing expectancy of life together with the declining birth rate, trends that have been evident for many years, have contributed to an increasing proportion of old people in the population. The proportion of persons of advanced age has been increasing steadily in the United States, and Missouri is no exception. In 1940, 8.6% of the population was sixty-five years or over and, therefore, eligible by age for some form of old age benefits.[3] The average percentage for the United States was 6.8 and few states had a larger proportion of aged persons than Missouri. Furthermore, the proportion has increased one-third since 1930. Before many years one person in ten will be eligible by age for old age benefits. Missouri faces a genuine problem in meeting this situation equitably and fairly.

Population Movements. The first movements of population in Missouri were those concerned with the settlement of the state and the initial exploi-

[3] U. S. Bureau of the Census, Sixteenth Census of Population, 1940.

tation of its resources. The state was settled by people originating for the most part in Kentucky, Tenessee, Illinois, Indiana, and Ohio, but as preemption gave way to a settled economic and social order they moved from Missouri to Oklahoma, Kansas, Texas, and in more recent years to California and eastern states, particularly Illinois. For many decades the state has exported population. Native-born Missourians have scattered far and wide in search of better economic and social opportunities. During the last ten years a large number of families, feeling depression, especially in southeast Missouri have migrated to California.

Internally, the growth of cities with their economic opportunities and deficiency of births, has brought heavy migration from the rural districts. The excessive number of urban persons aged 18 to 35 and the deficiency of persons of similar age in the rural population attest to that fact. The decline in rural population in Missouri from 1900 to 1930 can be accounted for only in terms of migration to urban centers. The slight increase in rural population during the decade 1930-1940, must be regarded primarily as a result of the failure of maturing rural youth to leave the rural districts, although urban-rural migration was also a factor.

The decline of rural population in Missouri through migration to urban areas since 1900 has been almost wholly a decline in farm population. Although the rural-nonfarm population has lost heavily by migration, the gain from surplus of births over deaths, together with persons moving from the farms to the villages, has been sufficient to more than offset the loss. The rural-nonfarm population has grown steadily since 1890, and the marked growth of 6.4% made during the last decade suggests that in lieu of opportunities in the cities many farm-reared youth were crowding into the villages. Whether village residence made the various agencies offering public assistance easier of access is not clear.

Since 1900 perhaps the most pronounced movement of population in Missouri has been the movement from the farms to nonfarm locations and occupations. During the decade, 1920-30, it is estimated that the net loss of persons from the farms of the state was equal to approximately 20% of the 1920 farm population.[4] During the same period the number of farms decreased 2.7%. Comparable figures are not available for the two previous decades, but the number of farms in the state decreased 2.7% in the next decade, but increased slightly between 1930 and 1940. Considering the demand for industrial labor during that period, particularly during the first world war, it is safe to conclude that the loss of farm population through migration was very heavy.

However, during the depression years, 1930-35, net migration from the farms of Missouri virtually ceased.[5] Some loss occurred in the better farming counties north of the Missouri river and in scattered counties elsewhere. About half of the counties experienced little or no net loss or gain. Many of the Ozark counties and also certain of the counties in the southeastern lowlands experienced a net gain in farm population from migration. Since 1935, net losses through migration have apparently been proportional to the increase in non-agricultural employment. At present, reports indicate that large numbers of rural persons have re-

[4] C. E. Lively and Conrad Taeuber, "Rural Migration in the United States." Washington: WPA Div. of Research, Research Monograph XIX, 1939, 140.

[5] C. E. Lively and R. B. Almack, "The Rural Population Resources of Missouri," Mo. Agric. Expt. Station, Research Bulletin, 306, p. 8.

sponded to the demand for defense workers. The State Employment Service reports that the demand for workers greatly exceeds the supply. In the better farming areas the year-round hired man has about disappeared and the trend toward mechanization of farm processes is further reducing the demand for anything but seasonal workers.

Migration and Rural Resources. The widespread migration from Missouri farms since 1900 requires explanation beyond the general statement that the migrants saw evidence of better opportunity in the cities than on the farms. More specifically, it may be said that a widespread adjustment of population to rural resources began about the turn of the century and is still under way.

There is evidence that the settlers who preempted the land of Missouri were not keenly alert to the economic implications of the different grades of land,[6] of which there were many. Although some of the settlers were interested in mining and some in lumbering, the great majority aimed to establish themselves in farming and took the traditional 160-acre tract of land. Whether the land obtained was good northern Missouri corn land or Ozark hill land where timber, fish and game were abundant made little difference, for the families were bent upon production for a living rather than for the market. However, as transportation facilities developed and the demand for agricultural products appeared, farmers gradually shifted to production for the market and production for use declined. As mechanical devices for use in agricultural production appeared they were adopted in the northern and western prairie areas with the result that workers were liberated and farms tended to increase in size. Thus the farm population of northern Missouri began to decline after 1890 and has continued to do so. Concurrently, tenancy developed and farms grew larger and more completely mechanized. The birth rate declined, incomes were translated into better living and the level of living rose.

By contrast, in the Ozark highlands, the population was driven to seek subsistence in a precarious agriculture as the fish, game and timber disappeared. The birth rate remained high, the population increased rapidly and the average family had too little land to obtain the means of a good living. The hills, denuded of forests, eroded so rapidly that a farm might be ruined in the course of a generation or two, and the level of living remained low or fell even lower. Under these circumstances, it is possible to show[7] that the application of labor to the land occurs in its greatest intensity where the land is poorest. Only in southeast Missouri, where cotton is the prevailing cash crop, has the farm population been spread over the land with considerable density. In 1930 the average amount of farm land per capita of the farm population of Missouri was 32.9 acres. In many northern counties the average was above 40 acres while in the Ozark highlands most counties were below the state average. But in the southeast lowlands the average was as low as 8 acres per capita in Pemiscot County. However, recent trends toward greater mechanization of agricultural processes and the substitution of wage workers, often non-resident, for share-croppers in southeast Missouri may tend to raise the average acreage per capita, although this

[6] C. H. Hammar and J. H. Muntzel, "Intensity of Land Use and the Resettlement Problem in Missouri." *Journal of Farm Economics*, 17 (3), pp. 409-422, August, 1935; E. D. Woodbury, "Population—Resource Relationships in Missouri," M. A. Thesis, University of Missouri, 1941, p. 33.

[7] *Ibid.*

is by no means certain. The rich soil resources of this area, the fact that there is still some new land to clear, the bonanza nature of the farming, the mild climate and the relative freedom from many institutional controls, all combine to make it an attractive place to many people who see in it the possibility of greater opportunity than in surrounding areas. Farm operators displaced in Wayne County because of the construction of the Wappapello flood control dam moved to the delta area in considerable numbers. Laborers and displaced sharecroppers from surrounding areas move there, also, and although there is surplus labor and under-employment in the area, it may be that this pressure of population will continue until a more stabilized and institutionalized economic and social order is developed in these lowlands.

It may be seen from the above that settlement following the prevailing notions of the day spread the rural population over the state in a pattern surprisingly even, considering the great variation in resources.[8] Subsequently, factors arising out of population increase, the exploitation of resources and the commercialization of agriculture brought into bold relief the potential maladjustments in this settlement pattern. These may be briefly summarized.

In the first place, soil erosion and soil depletion have taken a terrific toll of Missouri lands. Excessive cropping with soil-depleting crops, methods of cultivation favoring erosion, removal of timber and other ground cover and other factors have made more than 40 percent of the land of the state definitely submarginal or marginal for arable agriculture, according to some estimates. Some of the readjustments necessary to partially correct this situation, such as the reduction of row crops and development of more livestock, will probably tend, temporarily at least, to decrease rather than increase the number of people living on the land.

In the second place,the mechanization of agricultural production processes proceeding rapidly everywhere outside the Ozark highlands is effecting a decrease in the farm population because of the release of manpower and the accompanying increase in size of farm. The number of tractors in Missouri increased from 25,000 in 1930 to 45,000 in 1940. One farm in six now has a tractor. Nearly half of the tractors enumerated by the 1940 census were less than four years old. There are now many counties in which the farms have one tractor for every three automobiles. In some areas virtually all of the larger farms are supplied with tractors, and in many areas the smaller as well as the larger farms are "tractorized" by virtue of custom work performed by farmers or others in possession of tractors and equipment. The effect of this mechanization upon size of farm is notable. The total number of farms in Missouri in 1940 was approximately equal to the total number in 1930, yet during the intervening ten years the number of farms of 260 acres or more increased 14.5%. The increase was most pronounced in the best areas of northern Missouri.

In the third place, the declining resources of the Ozark highlands, the rapid growth of population and the limited experience of the isolated population with conditions elsewhere have combined to produce an acute condition requiring heavy emigration on the one hand and a readjustment of the prevailing economy, or to one more suitable to the limited resources of the area, on the other. Experience with groups of these Ozark

[8] C. E. Lively and A. B. Almack, *loc. cit.*, p. 20.

families, in areas where forced depopulation has been necessary for defense and flood control purposes, reveal a people extremely local in outlook, generally undernourished and often in need of medical care. There is a high proportion of elderly people often living in meagre quarters on small tracts of unproductive land.[9] Production is low and the level of living is low. The readjustment of Ozark population to the resources of the area in such a manner that the population may become self-supporting in health and decency is a major problem confronting the state of Missouri. By whatever valid measures used, the pressure of population upon resources is greatest in these highlands. Defense employment may relieve this pressure temporarily by drawing off many of the able-bodied workers; but if the highlands are further neglected, depression following the defense boom is likely to fill these hills with unemployed people without resources, crowded into inadequate houses, in an area where the physical resources are already overtaxed. A systematic social policy is needed for these highlands to the end that: (1) the agriculture may be adjusted to prevent further wastage of the meagre soil resources; (2) forestry (including more complete use of present wood products) may be systematically developed; (3) the tourist trade may be further developed by making the area more attractive to tourists; and (4) the opportunities for useful education of the native youth may be improved so that potential workers emigrating from the hills will be in a position to bargain in the labor market for something more than those unskilled jobs which are the first to be discontinued when depressed business conditions arrive.

Migratory Labor. The state of Missouri is not characterized by a large volume of migratory agricultural labor. Although the year-round hired man is disappearing and farm operators rely largely upon seasonal labor, either regular or casual, a very large proportion of such labor is of local origin. *Map 2* shows the number of wage laborers employed on the farms of Missouri during the week of September 24-30, 1939, by counties, as enumerated by the 1940 Federal Census of Agriculture. The number of laborers employed, as indicated by these figures, is probably near the maximum for southeast Missouri because of cotton picking. The number is probably much below the maximum for the small fruit area of the southwest, the corn-hogs area of the northwest and possibly for others. However, the general picture of the State based upon these figures is accurate in emphasizing that most wage labor in agriculture is employed in the southeast cotton delta, the southwest small fruits and hay area, the northwest corn-hogs area and the truck and fruit areas near St. Louis and Kansas City. Apparently there is less tendency now than formerly to use unskilled Ozark workers in the better farming sections of northern Missouri, and reports are that Ozark laborers are little used in the cotton-producing lowlands. On the other hand, considerable seasonal labor from Arkansas and other points south has been reported working at the picking of cotton and small fruits in southern Missouri. On the whole, it would appear that the agricultural economy in Missouri is moving toward the employment of relatively less migratory seasonal labor and more local mobile labor.

[9] Albert Mussman, "Implications of Land Use Adjustments in Connection with the Defense Program," mss., Dept. Rural Sociology, University of Missouri, 1941.

PERSONS 14 YEARS OLD OR OVER WORKING AS HIRED LABORERS.
SEPTEMBER 24-30, 1938
Map 2.

Population and the Defense Program. At present it is impossible to give an adequate picture of the significance of the program of national defense for the population of Missouri. The upturn of the business cycle bringing better prices for farm products and the decline of unemployment are most significant, as extensive unemployment and under-employment existed in both urban and rural areas. A number of defense industries have been located in the state. The construction of Fort Leonard Wood in Pulaski County has in effect been equivalent to the development of a city of 50,000 people in a strictly rural setting. The original residents have been displaced and scattered. New residents (soldiers, workers and hangers-on) have poured in. Housing, schools and other facilities necessary for living in a densely populated area have been grossly lacking for the non-military population. A similar scene is being enacted in the Neosho area where Camp Crowder is now being constructed.

The location of training camps and defense industries in the Ozark and Ozark border areas in close proximity to an abundant supply of unemployed and under-employed labor and somewhat removed from the great population centers of the northeast is a sound procedure and should be commended. Aside from the desirability of decentralized war industries, it would appear to be desirable, so long as state residence requirements are in effect, to keep a considerable proportion of our national industrial activity distributed among the states and the people somewhat in proportion to the incidence of the employable population. Ours is no longer an agricultural nation. Any state that is compelled to rely wholly upon agriculture to provide the means of a living for its people is certainly handicapped as a member of our community of states. This is particularly true of areas such as the Ozark highlands where agricultural resources are meagre and the labor supply abundant. These workers must either leave the rural areas for industrial employment or accept progressively lower standards of living in their native habitat. If they find it necessary to travel to other states where residence requirements are difficult and where, in congested areas, housing shortage may be very acute, unemployment may leave them stranded in a situation even worse than that of their native hills.

One caution should be urged. When locating in rural areas projects requiring the purchase and depopulation of large areas of land, some injustice is likely to be imposed upon the displaced population. Experience with more than a thousand displaced families in Missouri indicates that the injustice done is likely to be proportional to the speed of depopulation. In any case, it would appear that such injustice can be held to a minimum if available facilities for managing the depopulation of such areas are effectively used. The necessary agencies and resources exist, but unless a greater degree of understanding of the human aspects of this problem exists, and unless a

coordinated approach on the part of the federal and state agencies is effected, unnecessary injustice to the local population will continue to be associated with the development of these projects.

Population and Health. This paper would be incomplete if it failed to emphasize the growing need for a positive program of health improvement for the population of Missouri. Defense needs are making us increasingly aware of the physical inadequacies of our people. Draft rejections have been disconcertingly high. In spite of our great food supply there is widespread evidence of faulty nutrition. Almost everywhere in rural areas there is a shocking lack of adequate medical and hospital service at a price that the rural population can pay. There is a suspicion that disease, defect, and malnutrition have so devitalized many potential workers in the poorer rural areas that they cannot meet the requirements of full-time employment. The physical rehabilitation and improvement of our population must now be regarded as a public responsibility. Health is a major line of defense.

Forecasting the Demand for Electric Energy

By J. E. GATES *

Few and unhappy have been the attempts to forecast the demand for electric energy. The only reasonably successful method unearthed so far has been that of the National Resources Board, in its study entitled "Patterns of Resources Use," which attempted to place such forecasting on a statistical basis. This attempt was reasonably successful, as is pointed out in the paper by C. C. Lineau.[1]

Few laymen were aware, until recently, of these unhappy attempts to relate the supply of energy to the future demand. Many will remember the bland statements as to the sufficiency of electric power to carry us through the emergency period, and the fact that the shortage in the southeast seemed to follow almost immediately upon the heels of the statement. Needless to say, if a good method for forecasting had been available, and if it had been used, such a fiasco might have been avoided.

There are several methods available for such forecasting, borrowed from forecasting in other fields. The following is an attempt to use two of the methods, and to check them against each other. The more general questions of method are discussed in Lineau's paper.[1]

I. The Raw Federal Reserve Board Index of Industrial Production as a Measure of Demand

This method assumes that there is a casual relationship between the Federal Reserve Board Index of Industrial Production and the total demand for electric energy in kilowatt hours. The result, starting from 1940 data as a base, would be something like that indicated in Table I, extrapolated to 1942:

The errors in this method are not so great as to make it completely useless. It is clear that it overestimates the demands for energy in periods of prosperity, as in 1936, 1937, and 1941, and underestimates in times of depression, as in 1938. This is a conclusion to be ex-

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[1] Cf. "Statistical Methods: Forecasting Electric Energy Demand and Allocating Supply," C. C. Lienau, p. 110.

TABLE I.

Year	FRB Index [b]	Projected Output in Kilowatt Hours [c] (Billions)	Actual Output in Kilowatt Hours (Billions)	Error in Kilowatt Hours (Billions)
1935	87	102	98	4
1936	103	121	112	9
1937	113	132	122	10
1938	89	104	117	13
1939	108	127	130	3
1940 [a]	123	144	144	0
1941	155	181	170 [d]	11
1942	170	199	?	?

[a] Actual data. from reports of Edison Electric Institute.
[b] As reported in the Survey of Current Business. The figures for 1941 and 1942 are estimates, made by the author. The estimate for 1941 is based on eight months of actual data, and four months of estimates. The 1942 figure is a pure estimate.
[c] 1940 data = 100; all the other years are projected on that basis.
[d] The reports for 1941 are sufficiently complete to make this a reasonably good estimate, based on eight months of actual figures.

pected, *a priori,* because of the fact that although the sales of large light and power tend to move with industrial activity, as is shown in the succeeding section, domestic and small light and power sales are more "sticky," and tend to remain more constant in the face of rises and declines in industrial activity. They do respond to such changes in business activity, as is proven by the decline in sales for such purposes in the period from 1931 to 1933, and the sharp rise in 1937 to 1940, but the response tends to be relatively slow.

In its more usable form, this method involves using a similar method on only the sales for large light and power. The results indicated in Table II accrue, using the methods of the previous section.

Here the errors are smaller, both in magnitude and in percentage of the final result. This is logical, since the greater part of large light and power sales go to industrial establishments, whose activities figure in the preparation of the Federal Reserve Board Index of Production. This close relationship is important to the development of a forecasting technique, because large light and power sales respresent such a large proportion of total sales — over half in 1940. If sales for other purposes, as domestic and small light and power sales, are assumed to remain constant from year to year, and are added to a prediction of large light and power sales made as above, the results will be relatively usable, certainly more so than applying the index to total light and power sales. If a similar method is used for the other classes of service, and the results are put together, the results should have a great measure of validity.

By contrast with large light and power sales, residential and domestic sales tend to follow a different sort of development, being closely allied to changes in population, sales of domestic appliances, building construction, etc. Its constant rise since 1926 is interrupted only by a small decline in 1933. In every other year there has been an increase.

A similar conclusion holds for small light and power, which dipped downward only in 1931, 1932 and 1933, and then only slightly compared with the spurt in very good years like 1937, 1939 and 1940. It seems fair to conclude that prosperous years bring a rise in consumption for such purposes, a gain which is held — or almost held — even in times of depression.

TABLE II.

Year	FRB Index[b]	Projected Output in Kilowatt Hours[c] (Billions)	Actual Output in Kilowatt Hours (Billions)	Error in Kilowatt Hours (Billions)
1935	87	42.1	40.9	1.2
1936	103	49.8	48.7	1.1
1937	113	54.6	51.4	3.2
1938	89	43.4	43.1	.3
1939	108	52.3	51.1	1.2
1940[a]	123	59.5	59.5	0
1941	155	75.0	?	?
1942	170	82.2	?	?

[a] Actual data, as reported to the Edison Electric Institute.
[b] As reported in the Survey of Current Business. The figures for 1941 and 1942 are estimates by the author. The estimate for 1941 is based on eight months of actual figures, and four months of estimates. The 1942 figure is a pure estimate.
[c] 1940 data = 100; all the other years are projected on that basis.

II. Building the Total Demand as a Composite of Forecasted Demands of Classes of Customers

Whereas the previous method assumes that there is a necessary relationship between over-all industrial activity and the sales of electric energy for all purposes, or only for large light and power, this method assumes that there is no such over-all relationship, that in reality there are not only variations between classes of customers but also within classes of customers. It is obvious that domestic demand depends only slightly upon the degree of industrial activity but rather heavily upon other reasonably measurable factors, such as changes in population, sales of appliances, etc., which factors should be considered individually in making a total estimate. In large light and power, there is a clear differentiation to be made as between particular industries, some of which are moving upward while others decline in activity, a factor of particularly great importance in this period of emergency. It is possible to forecast fairly accurately the sales of energy to domestic users if the sales of appliances are known, together with the amount of construction of new buildings. Under the WPB programs this should be relatively easy to forecast. In the case of large light and power the degree of industrial activity of certain industries can be forecast with reasonable accuracy, particularly in this time of emergency when the larger users, such as iron and steel, are assumed to be operating at or near capacity, which will continue in the foreseeable future.

The following is an attempt to build up the total sales in 1941 to each class of customer, and to get a grand total estimate on that basis.

Large Light and Power. In Table III an attempt is made to build up the total demands for large light and power as a composite of the demands of seven industries which purchase large blocks of energy, amounting to approximately 75 percent of the total energy reported purchased by manufacturers in 1939. The

TABLE III. LARGE LIGHT AND POWER SALES FOR SEVEN INDUSTRIES, 1939 AND 1941

Industry Group	I Energy Purchased in 1939 kwh. (millions)	II Percent of U.S. Total [a]	III 1941 Production Rate, as a Percent of 1939 [b]	Estimated Demands for Electric Energy in 1941 kwh. I × III
Iron and Steel	7,653	17.0	180	13,600
Chemicals	5,554	12.0	146	8,109
Paper	3,258	7.0	180	5,864
Textile Mills	5,198	11.5	164	8,526
Food	4,998	11.0	122	6,098
Non-Ferrous Metal	4,794	10.5	142	6,807
Stone, Clay and Glass Products	3,259	7.3	132	4,302
TOTAL 7 Industries	34,710	76.3		53,306
TOTAL All Industries as reported to Census	45,040	100.0		69,000
E. E. I. Sales of Large Light & Power 1939	51,108			78,200

[a] As reported to Census of Manufacturers, 1939.
[b] 1939 = 100 as reported by Survey of Current Business.

total industry purchases of each industry are translated into 1941 purchases by relating the degree of business activity in 1939 to the degree of that activity in 1941. The totals for these industries are then related to 100 percent of those groups reporting to the Bureau of the Census in 1939, and that figure is then related to 100 percent of large light and power sales in 1939, as reported to the Edison Electric Institute in 1939.[2]

Forecast on this basis, the total sales for large light and power purposes will be 78.2 billion kilowatt hours. That figure is transferred to Table V, which summarizes sales, by classes. This total should be compared with the total of 75 billion kilowatt hours, arrived at in Table II, when the large light and power sales were assumed to vary with the degree of over-all business activity. The error here can be explained at least in part by the fact that in the list are only the large users of energy, which are having very good years in terms of business activity, as compared with some of those which are missing, and who are not having such good years. If all industries were included, the estimate would undoubtedly decline, because of the inclusion then of these less-active industries.

Residential and Domestic Use. Table IV summarizes the uses of energy by various classes of domestic appliances in use in 1941, on the basis of information on the number of such appliances in use at the beginning of 1941, their anticipated sales for the year, and an allowance for retirements during the year. This material is taken mostly from reports by the Edison Electric Institute, together with reports of sales of such appliances as reported by the National Electrical Manufacturers Association.

The use of lighting is assumed to remain constant per customer, and the total is assumed to increase only by the normal—of late—increase of one million in the number of such customers. In the table all figures have been rounded off.

Small Light and Power. Similar methods are not available for forecasting the demand for small light and power. The movement of such sales seems to have a pattern more like residential use than like that of large light and power. On that assumption, small light and power

[2] As reported to the Census of Manufacturers, 1939, U. S. Department of Commerce, Bureau of Census, Census of Manufactures, 1939: Prime Movers, Motors and Generators; Electric Energy Consumed, Summary for the United States—Preliminary Report, April 6, 1941.

TABLE IV. ESTIMATED CONSUMPTION OF ELECTRIC ENERGY FOR DOMESTIC PURPOSES, 1941 *

Type of Use	No. of Users on Dec. 31, 1941	Average Usage per year, kwh.	Total kwh. used in 1941 (000,000)
Lighting	26,000,000	317	8,242
Refrigerators	18,775,000	356	6,682
Ranges	3,040,000	1,020	3,101
Radios	No Increase		2,147
Water Heaters	869,000	2,500	2,173
Flat Irons	No Increase		1,538
Oil Burners	No Increase		386
Washing Machines	12,325,000		296
Miscellaneous	Average Increase—20%		1,441
		TOTAL	26,000

* Source: E. E. I. Bulletins, February 1940: Year 1940.

sales are assumed to change in the same ratio and direction as residential use. This checks closely with information supplied by the Edison Electric Institute, which reports the two classes of use increasing during 1941 in about the same proportion.

Total Sales and Generation. Table V summarizes the total sales to the three classes of users: domestic, industrial, and commercial, which in 1940 purchased 88% of the total energy consumed. If their ratio of increase is typical of other uses as well, it would be fair to use their projected 1941 consumption to prepare a projected total use. This is attempted in the table, and produces a total sale of about 144,000,000,000 kilowatt-hours. If losses remain in the same ratio as in 1940—about one unit of loss to six units of sales—the total generation in 1941 can be assumed to be 168 billions of kilowatt-hours.

Total generation is thus assumed to bear a constant ratio to sales, which is a very conservative basis of estimate. Actually, as a system becomes more and more overloaded, losses will tend to rise. The figure as computed checks, however, with the Federal Power Commission data, which shows sales of energy (and hence generation) rising by almost 20 percent, in the last half of 1941, and by about 15 percent, the first half of the year, for an average of 18 percent, to date (November 15).

Conclusion. The methods used here are admittedly rough, and all will bear refining. It is possible, for example, to apply the method used for large light and power and residential services to the other kinds of service. They are so small, however, as not to warrant such a procedure in this preliminary discussion. The end of 1941 will present an opportunity to verify the accuracy of the predictions made herein.

TABLE V. ESTIMATE OF ELECTRIC ENERGY REQUIRED IN 1941, BY CLASSES OF SERVICE

Class of Service	Kwh. Used in 1940 (millions)	Estimated Demand in 1941 kwh. (millions)	Percent Increase in 1941 over 1940
Domestic	23,318	26,000	8.6
Large Light & Power	59,557	78,200	25.0
Small Light & Power	22,373	24,500	8.6
Total—Above three classes	105,248	128,700	21.8
Total—All classes	118,643	145,000	21.8

Urban Land Department

MORTON BODFISH, *Editor*

Translating Research into Progress through the Journal of Land and Public Utility Economics

THE *Journal of Land & Public Utility Economics* is the product of the pioneering of Dr. Richard T. Ely and it has continued to reflect the thinking and personality of its founder. For seventeen years the *Journal* has been the medium through which studies, facts, ideas, hypotheses, theories, and conclusions have been presented to men and women everywhere who have an interest in land economics or a stake in the land, or who are concerned with the problem of transportation and public utilities generally.

It seems appropriate at this time when the *Journal* is being transferred from Northwestern University back to the University of Wisconsin to recall how it has served as a medium of presenting the results of research of the many people working in the field of urban land economics. In so doing we shall also point out some of the accomplishments as well as suggest a number of problems still to be solved in this sector of land economics.

The value of a periodical such as *The Journal of Land & Public Utility Economics* becomes more clearly evident as slum areas spread, cities break apart, central urban areas decay, property tax delinquencies mount, difficulties assail the supplies of various public services, and as loose thinking spreads and permeates the private and public agencies which are responsible for these basic elements in our standard of living. The American city is today at the crossroads. It can continue to "boom on the edge and bust in the middle" until all urban land values are destroyed or seriously imperiled, or its problems can be carefully studied and courageously attacked. Loose thinking, haphazard development, and irresponsible promotion will have to give way, and quickly, to experienced scientific study, to carefully planned development, and to responsibility to the community as a lasting social and civic group.

In reviewing the period since the *Journal* was founded certain achievements in research, study and action in the urban land field are significant. For instance, real strides have been made in recent years in bringing a measure of order and economically sound procedures into the whole land and mortgage financing system in this country; and without exception these can be traced back to research, scientific thinking, and persistent effort to bring about the changes and improvements which facts and research have indicated as being wisest, and by remaining intelligently honest in all decisions affecting land uses and real estate and mortgage lending procedures and institutions.

It is tremendously educational as well as interesting to compare financing procedures and institutions in 1942 with those in 1925, or even 1930. The greatest changes have come in home mortgage financing. Mortgage credit has been adjusted to the nature of the security and the credit instruments. Home mortgage money is more readily available to all families in every community and at substantially lower costs. Mortgage financing is safer for the borrower and the lender. The unsound straight mortgage has been virtually eliminated. Second and third mortgage financing with all high costs and abuses is a thing of the past. We have brought more money into the home mortgage field, have made it possible for more families to own their homes, and, most important of all, have provided the means whereby a complete breakdown of the home mortgage structure in depression periods may be prevented; and heartbreaks, loss of family security and loss of homes avoided. In this connection it is interesting to recall that one of the first of a series of urban land texts edited by Dr. Ely as a by-product of the Institute at Wisconsin, and later at Northwestern, was "Elements of the Modern Building and Loan Associations" by Horace

Clark and Frank Chase which stood as the principal text and reference book in the savings, building and loan field for thirteen years.

In the field of city planning and study of urban uses great progress has been made since the depression and since a stabilized urban population has brought out into clear relief the need for corrective action and orderly planning of cities. Gone is the concept that city planning is merely the programming of public buildings, beautiful avenues, and colored fountains in impressive array. We now plan to make the city a good place in which to live, to work, and to play, as well as a place to impress visitors and sightseers. Planning now touches all phases of metropolitan living—location of factories, parks, schools, thoroughfares, and shopping centers; elimination of dirt, noise, and slums; stabilization of residential and business sections; preservation of what is good and necessary; improvement or elimination of what is bad and undesirable. The city of tomorrow will be based on planning, facts and research.

Methods of land development are changing. There is evolving a definite tendency to merge the functions of promoter, land developer, subdivider, and builder into one person or organization. Progress is being made in the aim of providing lasting community value in new real estate developments. Land today is no longer being subdivided because there are "suckers" to whom lots may be sold; and the country should not again experience a repetition of the abuses and wild speculation of the Twenties. Progress is being made in preventing communities from being stillborn as they frequently were ten and fifteen years ago. Through research and planning, lots, streets, shopping areas are now being laid out so that land values may be stabilized and the amenities of the neighborhood preserved.

Real estate brokerage is today on a vastly higher plane. Real estate middlemen are beginning to have a very definite appreciation of their responsibilities to the community. High-pressure selling and speculation are giving way to common sense salesmanship and meeting prospects with facts.

A whole new approach to the problem of housing the lower income groups is evolving. Slums, substandard living conditions, and housing costs are receiving public attention. Answers to these problems have not been found as yet but we may trust the genius of the American people to find the answers through research, experimentation, and invention.

These are just a few examples of the progress that has been made in improving the American standard of living through research, study and action in the urban land field. Studies and analyses on these problems have appeared in *The Journal of Land & Public Utility Economics* since its first issue in January, 1925.

Although much has been accomplished in land economics, much more still remains to be done. The whole problem of low-cost, low-rent housing is just beginning to be approached objectively, with a realization of the scope of the problem and the comprehensiveness of the solutions that that must be sought. The property tax still remains real estate's Number 1 enigma. Tax delinquencies continue to mount, property values are depressed by taxes, and abuses abound. Solutions to the property tax problems should be based upon research rather than expediency or the inspiration of the moment.

Another of the problems on which little progress has yet been made has to do with the mortgage laws of the several states. Thousands of mortgage borrowers and lenders every day pay thousands of dollars unnecessarily because of antiquated mortgage laws. Model laws reduce loan cost and foreclosures cost and time drastically and still have been drafted to provide every protection to borrower and lender. With respect to this problem, the action stage has been reached. Improvements can only be secured by the creation of an informed and insistent public opinion, and this phase of the broader problem of land economics is equal in importance to the research and planning phase.

We have just begun to work on the whole problem of urban decentralization and orderly planning of land use. Years of planning and countless improvements in living and trading conditions in central cities will be necessary before the decentralization trend can be broken — if that is possible at all.

Changes in land uses, property values, and practices relating to the production of land for use and to the marketing and financing of land will continue so long as population shifts continue and our economic society remains complex and dynamic. So long as we have change and an economically free enterprise in which improvements are possible, so long will research and scientific thinking in the urban land field be needed. Just as recent improvements in mortgage financing and land development have their roots in research and study of financial and land systems in this and other countries, so will sound progress in the future be founded upon further research and study and the publication of results of such research and study.

The Journal of Land & Public Utility Economics has a vital role to play in the future development and stabilization of America's urban land economics. As an established scientific and research publication in this field it can be of tremendous importance in transmitting analysis and ideas to thinking men and women everywhere. Progress can be made only if there is wide understanding of new problems and common agreement as to the wisest solutions of those problems. It does little good to dig out facts if they remain buried in the archives. The *Journal* is the "catalytic agent" between research and progress. It has served that purpose admirably for seventeen years at Northwestern University and I know it will continue to serve that purpose at Wisconsin University.

The *Journal* has added greatly to the prestige and educational standing of Northwestern—particularly to the Land Economics and Public Utility Departments. Speaking for Northwestern, we have been proud to have been the home of the *Journal.* It is appropriate that it return to the University of Wisconsin where Dr. Ely first planted the idea of research and planning in land economics and public utilities. We wish the *Journal* godspeed and know that it will continue as the outstanding scientific and technical publication in the land economics and public utility fields.

MORTON BODFISH

Chicago, Ill.

Land Resources Department

V. Webster Johnson, *Editor*

Land Economics in Transition

To the land economist *The Journal of Land & Public Utility Economics* is a most significant publication and it is indeed gratifying that the University of Wisconsin, which has contributed so much to the literature and thinking in land economics, should assume the responsibility for continuing its publication. Under the leadership of Professors Ely, Hibbard, Wehrwein and others, research and teaching in land economics have been carried on at Wisconsin for many years.

Originally sponsored by the *Institute for Research in Land Economics and Public Utilities*, the *Journal* has presented not only the results of the work of the *Institute*, but also the writings of others. In January, 1925, the first issue appeared and since that time the editorial policy has recognized the social importance of economic research and of disseminating the results of research. In the first issue Professor Ely writes that "The Institute . . . may not always agree with the opinions and conclusions of some of its contributors, but one believes that the best solution to any problem comes from a full and free discussion of the merits of both sides of the question." In times like these when "full and free discussion" of social and economic questions is curtailed or prohibited throughout much of the world, it is doubly important that the policy expressed in the first issue be maintained. In the spirit in which the *Journal* was conceived, it has continued as a significant force in bringing research findings and points of view in the field of land economics to its readers. There is need for such a journal to keep up with evolutionary developments in the field. For the field is changing, as is evident from a review of the transition from its early conception to problems around which current interest centers.

As with the development of any field of work, the foundations for the research methods and the ideologies of land economics are rooted far in the past. The German historical economists, under whom Ely and some of his associates studied, have had a profound influence. Following the approach of the historical school, land economists have devoted major attention to descriptive and problem analysis work. Those in government and those in state and other institutions have busied themselves largely with current and pressing problems growing out of the use of land. Land economics is a field of study rather than a body of theory, or, better still, it is a group of related subjects of study. However, the land economists have carefully scrutinized their work, particularly within recent years, for the purpose of strengthening its theoretical background as indicated in such papers as "The Content of Land Economics and Research Methods Adapted to its Needs" by Leonard A. Salter, presented before the American Farm Economics Association in 1941.

During recent years, land economists have devoted a major part of their efforts to the study of land problems and to the development of policies and programs for dealing with them. Because of relatively free and socially undirected occupancy and use of land resources, widespread maladjustments developed as indicated by the millions of acres of tax-delinquent land, unstable land values and frequent foreclosures, overburdened local government organizations, and insecurity of land tenure. To meet these problems much attention has been given to land inventories, rural zoning, management and development of public land, farm tenancy, land value surveys, relationship of land use to local government, and to the development and analysis of conservation programs. In dealing with these situations, the land economist must be something more than a discoverer of fundamental relationships. He must be an artist in planning the proper utilization of resources and he must be a statesman for bringing plans to fruition. In the words of Frank A. Fetter, "My own conviction has long been that the land question far transcends any restricted field of economics and that it is fundamen-

tal to national survival and national welfare. It is truly a problem calling for statesmanship of the broadest type."

The essence of the job of the land economist is to analyze problems and to ameliorate conditions growing out of conflicts of interest in the use, occupancy and management of land. The job is contiually shifting as the social problems and phenomena with which it deals change in emphasis or in kind. Particular consideration must always be given to orienting research in the light of social processes and techniques of accomplishing certain objectives. Faced with the present challenge of war, research in land economics must be directed toward new problems and new relationships, the knowledge of which is essential to the implementation of agricultural production needed for war and the prevention of unnecessary land-use maladjustments.

Today land economists, along with other scientific groups, are reorienting their work to the needs of war and to service in the crucial post-war period. Lines of work in the Division of Land Economics and in the experiment stations are being dropped, suspended, or reoriented to problems growing directly out of war. The depression problems of new settlement, resettlement, submarginal land retirement, rural zoning, soil conservation, local government finance and reorganization have lost their urgency for the duration, except insofar as they are significant in retaining present gains and avoiding unnecessary maladjustments. These problems have not been solved or mitigated nor have they disappeared. Some of them will probably be accentuated in many parts of the country as a result of war dislocation and pressures. But these problems are now transcended by far greater problems of more immediate urgency to the Nation. "Conversion" of the land economist's facilities and faculties to meet these war-time problems is essential.

Agriculture has the exceedingly important task of producing the necessary foods and fibres to carry on the war effort. It has been difficult to realize that there can be food and fibre shortages. If American agriculture is to furnish those products needed by ourselves and our allies, it is necessary to marshall all our productive capacities to prevent serious shortages. Production goals have been established for the Nation, its regions, states, and even counties. How to translate paper goals into beef, milk, cheese, vegetables, fats and other commodities is the basic problem confronting agricultural economists today.

Agricultural production is affected by habit, custom, tradition, and other institutional arrangements as well as by price and market reactions. These institutional factors are of strategic importance in conditioning land use and occupancy. They are the "modus operandi." For the land economist working with land tenure, land use controls and land ownership, it is readily apparent that obstacles to production beyond the reach of price economics alone do exist and these must be overcome if the goals which have been set are actually to be achieved most expeditiously. In securing agricultural production increases, consideration must be given to the effect such factors as tenancy contracts, insecurity of occupancy, lack or insufficiency of production credit, and speculative land manipulations have on agricultural production; also to the impact of state and federal land and agricultural programs on production and to the place of such programs in preventing unnecessary postwar maladjustments. Studies of specific situations need to be made to determine the extent to which the institutional forces and similar factors affect production. These must consider not only the immediate problems but also the repercussions that present conditions and trends may have in the future.

One of the critical war needs is for additional production of livestock and dairy products. Expansion of such enterprises is definitely limited by tenure obstacles. Federal, state, and county public land policies may also be limiting factors in those areas in which public land makes up a substantial part of the productive resources. In such areas group-tenure devices are of aid in reaching the livestock goals and in maintaining insofar as possible, the desirable land use adjustments that have been achieved. Another "war job" for the land economist is to devise ways and means to prevent speculative land booms or excessive increases in land values which might increase ownership transfers to the point that they would hamper seriously the attainment of the actual production needed. Insofar

as possible, agriculture must be prevented from translating favorable farm prices into anything but a greater production of needed farm products. Agriculture must not make the mistake made by business in 1929 in shifting production profits to fictitious paper gains. By applying the knowledge, techniques and skills which he has acquired, the land economist can do much in helping to determine production goals and to achieve needed agricultural production through the removal or modification of various institutional obstacles to production.

Furthermore, a sharp break between war and post-war activities will very likely not be recognized, but rather the approach to most of the war and post-war problems will move forward on a common front. Many of the long-time desirable adjustments in agriculture and land use are in harmony with war needs. Examples of such are: greater stability of tenure, increased production of livestock products—particularly in the South—and improved public land management. Certain phases of the post-war planning program are entities in themselves, however, and represent a real challenge to the land economist. Following this war, there will be a tremendous job in readjusting our economy to a peace-time basis. Fundamental and far-reaching changes will occur both in agriculture and in industry. Demands will be expressed for veterans' settlement projects, additional land reclamation, protection of war-stimulated agricultural activities from demobilization or curtailment, and for many other such projects. All these must carefully thought out and planned if disastrous post-war conditions are to be avoided. The reabsorption of munition workers and military personnel into industry and the readjustment of agriculture to a peace-time basis will call for careful, detailed planning. Here the land economist has a real responsibility and can make a valuable contribution. Steps should be taken now for an orderly transition from all-out war to permanent peace.

In all land economics work it is important to bear in mind that adjustments to be made at the conclusion of this war must not and cannot be made solely in terms of the welfare of the American people. Agricultural programs and agricultural planning, to a large extent, must be carried on in the framework of totally different world conditions after this war. In such programs and in such post-war planning, the land economist has a formidable task.

In citing some of the "jobs to be done" it is not meant to imply that the land economist should consider only the agricultural production programs, but it is believed that he can make other definite contributions both toward winning the war and toward readjusting our economy on a sound peace-time basis. Despite his war and post-war tasks, however, the land economist should not totally abandon the ordinary programs of research. Much of the peace-time research programs can be carried on in a re-oriented setting of a war economy. Though they may have to be curtailed heavily, it is vital that they continue, at least at a "maintenance" pace. Research activities upon which can be builded an accepted body of land economics principles will always be necessary. A trained and experienced personnel and a firm back-log of sound research will be needed to meet the war and post-war problems.

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Progress in Arkansas Land Policy

THE Arkansas Land Policy Act of 1939, and the circumstances calling for its enactment, have already been reported in this *Journal*. Briefly recapitulating, this statute provided that state-owned lands, including those forfeited to the State on account of non-payment of taxes, should be classified and appraised as to their value, use capabilities and most appropriate future use, prior to disposition; that disposition of State land be in accordance with this classification; that mineral rights be reserved to the State; that homesteading be more rationally guided and controlled; that no sales should be made at less than appraised value; that unimproved land potentially

suited for agricultural use be developed for settlement projects if appropriate financial arrangements could be made; and that land primarily unsuited for farm use should be retained in public ownership for forests, parks, game refuges, etc. The Land Use Committee of the State Planning Board was vested with major responsibility for seeing that these policies were carried out, in cooperation with the State Land Commissioner to whom traditionally belongs the function of administering the public land laws of Arkansas.[1]

Since the Act has now been on the statute books over two years, it may be well to bring the readers of this *Journal* up to date on the progress being made to carry out its provisions.

The first year and a half of the Act's life may be characterized as mainly a period of administrative introspection. During this period, those interested in the Act studied its possibilities and explored methods needed to implement its objectives. Considerable consideration was given to devising proper lease, application, homestead and sales forms, as well as to clarifying and developing relationships between the Land Commissioner's Office and the Land Use Committee, a subject on which the Act was not altogether clear. While this period was not one of inactivity, it was, nevertheless, more a time of stock-taking and preparation that of vigorous administration.

Those responsible for the original legislation never fancied that the job had been accomplished merely by a statutory declaration of faith. Between the 1939 and 1941 sessions of the Arkansas Legislature it became increasingly apparent that the original Act needed to be supplemented by secondary legislation to round out and make effective its outline of main policies. Friends of the Act therefore went to the 1941 Legislature with certain proposals, which the Legislature favorably received. These proposals included: (a) an appropriation sufficient to employ a five-man staff to service the Land Use Committee and the State Land Commissioner in carrying out their primary mandate of classifying and appraising state land prior to making decisions as to its disposal; (b) a law to clarify the State's tital to tax-forfeited land, so as to strengthen the State's position in actually managing or disposing of its holdings; and (c) a procedure for handling mineral rights retained by the State under the 1939 Act.

With the enactment of these laws, and the reorganization of the Land Use Committee, Arkansas was well prepared to begin making the 1939 policies an actuality; and the record since the adjournment of the Legislature last spring gives evidence that the State is, in fact, moving ahead in actual administration. Arkansas thus now bids well, both in theory and in practice, to prove a fruitful experiment ground in progressive and rational management of the "new public domain" of tax-reverted lands.

What are some of the things that have been done since the adjournment of the 1941 Legislature?

First of all, the Land Use Committee, after thorough deliberation, has formulated administrative procedures, regulations and policies deemed desirable to effectuate the statute. These have been published in a concise and readable pamphlet entitled *Arkansas Tax-Forfeited Land: Manual of Policies and Procedures.*[2] The decisions reflected in the text of this manual, and its dissemination as a public document throughout the State, are in themselves important tokens in a State widely regarded as "backward" in the realm of scientific public administration. Secondly, the Committee has hired a corps of helpers (a "chief appraiser" and four field "appraisers"), for whose benefit it organized and conducted a short course in September, 1941—the purpose of which was to instruct them in land classification techniques and acquaint them with the objectives, principles and procedures of State land policy administration. Thirdly, the Committee has given attention to refining its lease forms, contract forms, donation application forms, etc. Fourthly, the Committee has consistently taken measures to integrate its own program with the programs of Federal and other public agencies having one or more similar objectives, as well as to enlist full technical assistance and cooperation from appropriate Federal agencies in doing a scientific job of land administration. Finally, it has actively begun classifying State tax-forfeited lands and making arrange-

[1] O. J. Hall, "Policy for Use of State-Owned Land in Arkansas," November, 1940.

[2] Land Use Committee of the State Planning Board, Little Rock, August, 1941.

ments for their appropriate disposition.

As listed in its Manual, the Committee has stated its intention of applying a number of principles which will, no doubt, be applauded by the land use planning fraternity. Among these, all of which are of course within the general framework of the 1939 Act, may be listed the following:

1. Particular weight will be attached to the recommendations of County Land Use Planning Committees and local technicians in making land classifications.

2. The policy will be to encourage farming in owner-operated, family-sized units. Preference will be given to bona fide farm families who intend to use the land for residential farming purposes and to neighboring farmers in need of additional lands to fill out a family-sized farm.

3. Efforts will be made to encourage diversified farming, farm forestry and similar practices where called for.

4. Financial assistance from the Farm Security Administration and other Federal agencies will be enlisted in developing and improving potential agricultural land which, under its present condition, is not suitable for farming uses.

5. Homesteaders must comply with the program of the Soil Conservation District.

6. Every effort will be made to secure necessary financial assistance for low-income families setted on state lands; and to provide them with needed technical assistance and supervision so as to enhance their chances of getting successfully established. In return, homesteaders may not alienate their holdings for at least two years after title passes (four years after entering possession).

7. No land will be disposed of for farming purposes, regardless of its innate adaptbility, unless it is so located as not to entail uneconomical public expenditures for road and school purposes.[3]

8. Land located within the boundaries of federal forest purchase units, if suitable for forestry purposes, will be offered to the Federal Forest Service.

9. Timber will be sold from state land only under suitable conservational restrictions.

The vitality of current Arkansas land policy administration is illustrated by a recent editorial in the *Arkansas Gazette*, commenting on a decision of the Land Use Committee, after lively debate, to withhold from homesteading all state land in the "Crowley's Ridge" area (a large, sparsely-settled region of generally submarginal land):

"A new conception, new in application in Arkansas, of the state's duty to itself and to its people was brought to public attention by the action of the state Land Use Committee in refusing to open certain state-owned Crowley's Ridge lands to general homesteading.

"The pioneer conception was that a homesteader had a right to make a farm and a home for himself wherever he could obtain the necessary land. In an earlier day it might have been held that this right to settle anywhere was as natural and fundamental as anything in the Bill of Rights. And it still may be asked: Why shouldn't a 'man be allowed to homestead where he pleases?'

"The answer is to be found in the state's obligation to its people as individuals and its obligation to protect the pubic interest. The state has an obligation to provide educational opportunity for every Arkansas child. We have even made school attendance compulsory for designated ages. But if a family or group of families settles on public lands remote from schools, the cost of providing school facilities for their children may be unreasonably high. Yet it would be unjust to the children, as well as against the public interest, to let them grow up illiterate. The most practical solution for that problem is obviously to keep homesteaders from scattering themselves in remote places when less remote public lands are available. The question of building and maintaining access roads may also be involved. Another consideration, brought out by Engineer-Director L. A. Henry of the State Planning Board, is the problem of conserving Arkansas' soil and water resources. The federal Soil Conservation Service has spent millions of dollars in the state making surveys and promoting programs to prevent erosion. Indiscriminate clearing and cultivating of hill lands might start erosion all over again in areas where it is being checked.

"The Land Use Committee will consider applications in special cases in the Crowley's Ridge area, but its general purpose is to prevent homesteaders—or save homesteaders—from marooning themselves in places where essential public services for their families would cost too much, and where cultivation of the land would be a 'loss instead of a gain to the productive resources of the State.' "[4]

[3] In addition to land withheld from sale for agriculture for this reason, there is also the withholding of all land deemed to be submarginal for farming. This is implied in the provision for classification of tax-forfeited land previous to disposal. See "Policy for Use of State Owned Land in Arkansas," *op. cit.*

[4] December 21, 1941. The *Gazette* is Arkansas' leading newspaper.

The War and its effects have created new and altered old problems in Arkansas land administration; and it is thus in point to underscore the freshness and adaptability with which the Land Use Committee approaches its serious-minded work.

Finally, it is worth emphasizing that Arkansas is in a real sense pioneering in state-federal cooperation—securing help of federal technicians in analyzing the problem and in drafting legislation and other needed documents to solve it; enlisting federal assistance in land classification and other administrative activities; working out arrangements for federal management of suitable tracts of state land; and, quite importantly, deliberately giving local representatives of a number of federal agencies a prominent place on the membership of the top control organ, the Land Use Committee. What is novel is not that there has been cooperation, but that its circumstances and character exhibit unusual aspects. For the cooperation has been outside the usual setting typified by conditional Federal grants-in-aid, or the local adoption of a Federally-sponsored standard act, or the local enactment of enabling legislation necessary to the operation of a federal program. On the contrary, the initiative has come from the State rather than from Washington, and the formulation of the conditions of cooperation has been local rather than federal.

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Watershed Management Requires Economic Studies

(This article expresses solely the personal views of the author.)

THE quantitative analysis of the economic and social benefits from expenditures on mountain watersheds is one of the most complex phases of the watershed management problem. The popular assumption has been that expenditures would be justified in most cases by the alleviation of erosion, the prevention of floods, and the production of water in more usable form and at a lower cost to the consumer. In addition, social benefits and monetary returns are increased in many cases by recreational use, forest products, and sundry emoluments. Of necessity, opportunism and an objective consideration of these elements have been, for the most part, the basis for the formulation of policies, drafting of legislation and appropriation of moneys. Are the difficulties of analyzing the many ramifications of the problem too great within the scope of present knowledge to prepare an economic balance sheet? Are we investing too much or should we invest more? Under what circumstances are we justified in incurring indebtedness for this purpose? To what extent are public agencies justified in "taxing" the immediate beneficiaries to amortize such indebtedness?

Upstream watershed management consists largely in protecting and developing the vegetative cover and instituting engineering works which, taken together, help regulate streamflow, curtail erosion, and make possible an increase in usable and low-cost water supplied to consumers at a time when it is most needed. The manipulation of forest-cover in order to reduce transpiration losses without at the same time accelerating destructive or undesirable run-off and erosion is at present a subject of widespread study and experimentation. The physical results, under varying conditions as they are supplied, require economic interpretation to make them socially significant. Likewise, the silting of reservoirs is a feature of much study and cost determination. The life of such structures varies directly with the condition of the cover of the drainage areas as well as other factors and may affect the expenditures for the conservation of such watershed cover.

Complex, indeed, are the factors involved in watershed management. Purposes alone seem reasonably well-defined even though multiple in character, interrelated, and evidencing variations between watersheds. The preventation or at least amelioration of floods and erosion, the delivery of maximum quantities of usable water where the need exists, the production and use of timber and forage, these and other objectives of management require a mass of factual information which must be analyzed, sifted, and integrated in the light of mone-

tary costs and returns and of social well-being.

If it were true that restoring the forest cover on watersheds would invariably prevent erosion and floods the problem would be much simplified. However, geologic formations, soil structure, gradient and slope characteristics, area and elevation on the one hand, and the frequency, duration and intensity of storms, and other climatic factors on the other, seem also to be of much importance. It would appear difficult to attribute the cause of a flood only to partial or total lack of vegetative cover although it might be definitely ascertained in many instances that it was the most important contributing factor involved. The expenditure of money for remedial measures, therefore, presupposes detailed consideration not only of all the above physical and climatic factors but of the economic ones as well.

The economic aspects of the management of our watersheds have not as yet been fully defined. For example, the value of property destroyed by floods may be appraised and the figure thus obtained may be pro-rated over the entire watershed area or perhaps only over the "sore spots" existing on the watershed. It may be assumed, in consequence, that the acreage figure thus arrived at serves as a reliable guide for the expenditure of funds per acre on such watersheds or on the "sore spots." This principle may require close scrutiny for two reasons: first, the flood may not have been caused primarily by the "sore spots," that is, the flood might have occurred even if no "sore spots" existed and the entire watershed was well vegetated (although to the extent that the flood would have been ameliorated by a well-vegetated watershed, a logical argument exists for this principle). Second, the criterion should be the value of property likely to be destroyed in the future. A consideration of this aspect of the problem must, of course, be guided by past experience relative to frequency and severity of floods. Such a study may disclose the necessity for preventing reconstruction and replacement of property values on or adjacent to flood areas, or possibly even abandonment of areas now settled. Those individuals who re-establish themselves on areas damaged or destroyed by floods contrary to best scientific evidence against such procedure perhaps should assume the risk involved.

Profound economic problems are presented not only in determining how much money should be expended on the watersheds but also and contemporaneously, whose money it should be. Usable water may have localized sources, but its consumption is not always localized. The water from Colorado watersheds is used not only in Colorado but in other states as well, while water from California watersheds is mostly used within the state. The extent to which products enter into interstate commerce may have a bearing on this problem. Perhaps, in some areas where watersheds are of greatest significance from the viewpoint of local agriculture, an unjustifiable measure of subsidy may exist, the correction of which might require greater state and local contributions. The land-use pattern in irrigated areas has developed in relation to the profits involved, and since water is an important item affecting profits, it follows that the expenditure of federal funds in varying degrees for water conservation presents a difficult problem of balancing land use between irrigated areas and those not requiring irrigation. Perhaps some irrigated areas would cease to exist if operators were required to contribute more directly to the cost of managing the watersheds upon which they are dependent.

To answer these and other questions that might be propounded requires authenticated facts based on research. Physical facts are undoubtedly being obtained as rapidly as conditions of the problem and finances permit. Economic and social factors should also receive consideration. The conservation economist should be able to render valuable assistance by working with the engineer, the meteorologist, the geologist, the soil specialist, and the agricultural expert. A start is now being made to recognize the importance of the economic and social aspects and to include such studies in the broad field of watershed studies. It is to be hoped that the conservation economist will be able to undertake investigations of this kind to a much greater extent in the future and thereby to contribute more substantially to solution of the many perplexing economic questions of watershed management.

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Transition in the Northern Lake States

FOR some twenty-five years, persons representing a wide range of physical and social sciences have been studying and contributing to the solution of the problems of the northern Lake States region. From the results of this work, one might draw a long list of various specific factors which have entered into making the region one of the nation's outstanding problem areas.

What may not have been emphasized enough in the work of the past is the rapidity with which changes in the land economy of the region have occurred. This factor is pervasive rather than specfic, yet it is one that social scientists must not underestimate if they take seriously their own concept of institutional lags.

An institutional lag occurs when people retain habits and customs even after there has been a change in the underlying conditions which originally gave rise to the established ways of doing and looking at things. Institutional lags are omnipresent, for men's relations to things, and the latter change first and more rapidly than the former. This point need not be labored here, but we should note that all lags are not of equal impact nor of equal duration and that they frequently overrun one another. Sometimes the primary shift evolves slowly; and sometimes the human relations are altered smoothly and in good time.

In the northern Lake States region, institutional lags are of particular importance because of the unusual nature of the changes in the primary conditions that have been experienced in the area. The changes have come speedily, and they have struck at the very heart of the region's whole economy. Relatively, at least, they have been abrupt and drastic. The area has been visited with sharp alterations, not in some isolated factors several steps removed from the livelihood of the people, but alterations that carried immediate and widespread repercussions. All this is so because the basic changes in the cut-over have been in the nature of revolutionary reappraisals of the total resources of the region.So far, we have recognized two such reappraisals in less than three decades. And this paper suggests that a third reappraisal may be in the making.

The history of the region has been told many times, so it is not necessary to recount it here. But attention may be called to the broad strokes in order to indicate the nature of the reappraisals emphasized in the foregoing.

For forty years, the region was the highest lumber-producing area of the nation. One-fourth to one-third of the country's lumber supply from 1870 to 1910 was taken out of upper Michigan, Wisconsin and Minnesota. The "saw log dynasty" was not a *part* of the region's economy during those decades; it was *the* regional economy. And then it just stopped. Paul Bunyan strode off.

We have had little detailed analysis of just exactly what happened when the great shut-down came, but undoubtedly a dizzy-spell of institutional adjustment ensued. At any rate, after a few years, the force of the area and of the states of which it was a part was turned to utilize the soil from which the trees had been harvested. Engineers, agriculturists, economists, real estate promoters and local residents all put themselves to the central task of raising up a new economy based on farming. No one can now say, given the conditions of the period, that they were wrong. The prevailing conditions justified the general nature of the activity, and so research studies were conducted with the purpose of reducing specific difficulties or hardships encountered in the process of farm empire building.

Whereas the "saw-log dynasty" reached, in terms of its own time, a glowing peak of achievement, the "second dairy empire" never came so close to reality. Farm markets, farm prices, and some of the soils gave out more quickly than the forests had. Nevertheless, the movement in the direction of a full farming economy was maintained for a sufficient duration to carry over long after the shift in basic conditions had taken place.

The next evaluation of the region's resources was not arrived at so easily as the previous one. In the first instance, the soil that had been bared by lumbering offered a visible and obvious suggestion as to what the next base of the economy might be. But in the second instance, the soil too was

at a discount, and the trees were still gone. The evaluation finally was that the economy must be based on a thrifty utilization program for both resources: to improve farming to the extent that prevailing conditions seemed to warrant, and to undertake the hard job of reestablishing private and establishing public forestry.

The economy that was envisioned was a farm and forest economy. This two-legged economy meant considerably more than a mere amalgamation of the two types of activities which the region had previously sought to stand on, one after the other. For while trees and soil were still looked to as the major sources of livelihood, a new set of institutions was required, entirely different from those designed for the "saw-log dynasty" and the "second dairy empire" eras. The famous work in the region involving zoning, land purchase and exchange, forestry aids, resettlement, public works and tax revision programs indicates that new institutions had to be forged and old ones overcome.

Before going into the question as to whether the northern Lake States region is facing a new transition, we might note additional implications of the institutional lag concept for scientists. In the first place, since the scientist is himself conditioned by the environment in which his problem exists, he must be cautious lest his work itself be subject to the lag. Secondly, the type of contribution which the social analyst can make is largely determined by the timing of his work and the development of the lag. The question is whether the scientist can see the movement of the underlying conditions before they begin to chafe against the superstructure of local human institutions—or whether he sees the problem only after the lag is considerably advanced. In either case, the scientist's assistance may be great; but in the former instance he can practice preventive medicine and in the latter his work is essentially corrective. And in so far as his sights are set upon corrective planning, he may court the risk of missing oncoming new trends and tendencies.

The conditions that constituted the underpinning of the "second dairy empire" era in the upper Lake States were completely reversed by 1921 or 1922. Yet the analyses of the region's problems did not begin to reflect the wide nature of the transition until the irritation of the changing primary conditions against local institutions was already severe enough to have raised the canker of tax delinquency. And it was not until still later years that proposed solutions really embodied the conception of a new future regional economy.

In view of these general characteristics of institutional lags, one may be allowed the privilege of stressing new primary changes even at the risk of unwarranted emphasis. At least, the emphasis may be allowed if it aims at putting investigators and planners on guard and as long as it is not interpreted as pressing a conclusion instead of suggesing a beginning hypothesis. It is in this setting that one might raise the question whether certain recent changes in the northern Lake States do not hint at a new transition in the region's economy; and, if so, whether it may not be important to consider a new tack in research and planning for the area.

A recent publication by Professors Andrews and Bromley [1] presents the result of a study of changes in the northern Lake States region, based on certain comparisons in four northern Michigan counties for the years 1924 and 1939. This report has significance not just because it includes some impressive indications of changing conditions, but perhaps even more because it may be used to mark a turning point in the orientation of investigations and programs in the region.

The reader of the Andrews-Bromley report will feel a certain unbalance between the underlying research and the tenor of the written report. He will feel that the large bulk of time, effort, and money that went into the study was spent on the careful collection and organization of data which, in the final analysis, contribute least to the importance of the work. On the other hand, those phases of the report which presage the need for courageously new programming seem to have been the poor relations in the project organization. A probable explanation of this lack of balance would seem to be that the study of changes in the area was conceived and set in motion

[1] H. J. Andrews and W. S. Bromley, *Trends in Land Use in Northern Michigan*, Charles Lathrop Pack Forestry Foundation, Washington: 1941.

under a given prevailing appraisal of the regional economy; whereas it appears that the changes taking place prove to be of such a type as to require a revision of that very appraisal. The result is what may be termed (borrowing from the geologists and from W. P. Webb), a "research fault." The strata of data collection, analysis, conclusions and recommendations although formed in a fairly orderly pattern are still beset with noticeable misalignment.

If persons interested in the northern Lake States region and in land economics research in general see this import of the Michigan study, they will not take the foregoing comments as an unfavorable appraisal of the study. Rather they will be happy that Andrews and Bromley did not rest content with the planimetering of land classification maps but took a few new steps in observations which hint that the oncoming problems require the development of new social planning tactics.

In the concept that has prevailed for 15 years among those who have given thought to it, the future northern Lake States economy has been seen as one based, for the most part, on agriculture and forestry. The problems were: (1) to get, and keep, farms on soils worth farming and in areas with low government service costs; (2) to encourage private forest improvement and to enlarge public forestry enterprises; and (3) to encourage recreation enterprise in the special water-front locations where it might develop.

In this view, an important question is whether there is more or less farming and whether the change is taking place on good or poor soils. To look into this question, Andrews and Bromley cross-checked "land use classifications" of 1924 and 1939 and soils maps in detail, recognizing "farm," "forest" and "abandoned" land uses.[2] If these are the major land uses of an area, they can be measured on aerial photographs. The results of this check would indicate that not much has happened. In an area of one and a quarter million acres, less than 40,000 acres changed in any direction. About 20,000 new acres went into farms and a somewhat smaller area was taken out of farms. On the whole, there have been "no outstanding or revolutionary changes . . . in the broad land use pattern."

However, whereas these carefully calculated acreage figures show only a net change of one per cent in the acreage of "farm" land, a few simple figures from other sources suggest a different story. For in the same area, in fifteen years, the number of occupied residences has increased over eight per cent; and all of this increase occurred in areas classed as a "wild-land zone." In terms of population, "the rural population has increased 29 per cent in the last 10 years."

"Since the net increase in farm area observed was only 3,205 acres, it is obvious that farming could have provided a livelihood for only a small proportion of the 5,043 new rural residents," many of whom "do no farming and frequently do not maintain a garden." Among them are those whose arrival is a part of the decentralization of local industrial centers; those who are new workers in the local recreational industry; and those who have come in as a result of unemployement in cities, and "a large proportion of these workers were former residents of the territory or had other local ties."

Since non-farming and non-forestry elements appear to be the most important factors of change, one wonders whether there is need for reappraising our basic concepts of problems and programs in the region, in view of the fact that our thinking has been so largely premised on an agriculture-forestry evaluation of the economy. To what extent, for example, should we continue to think of the settlement problem in terms of soil quality? Andrews and Bromley hold to this interpretation of the settlement problem. They believe that the "forest-farm-abandonment cycle" would be mitigated "if those looking for potential farm land knew which soil types were likely to be most productive, where they are located, and how they might best be developed." They deplore the fact that even though "information of this type has been available for many years," settlement has continued on poor land and in wild-land zones for the last 15 years. But, if as has been shown, the newcomers are not looking for potential farm land, how can a proposal have any meaning if it is predicated on the assump-

[2] A fourth class, "other," includes "lakes and villages, etc."

tion that the settlement problem is a soil quality problem?

In the "second dairy empire" era, it was perfectly reasonable to assume that settlers in wild-land zones on poor soil were "stuck." Today, the same phenomenon may only mean that the settler got what he wanted. This is not to suggest that any settlement is socially justifiable and therefore should go unregulated. Rather it suggests that the criteria of justified and unjustified settlement may need to be redefined, and the objectives of regulatory programs may need to be recast. Certainly, if the major settlement changes of the past 15 years indicate that a chief function of the region is to serve as a place of residence, refuge, or retirement for a non-farming population, it must be insufficient to construct a program by considering these phenomena as merely unstable influences and by omitting them from the "basis for anticipating and guiding future developments along lines that past experience indicates to be sound in the light of the physical, economic, and social factors involved."

The second leg of the regional economy that has been projected heretofore has been forestry. In the view that has prevailed, the important problems have been to improve the forest stock and to expand public forest management. To look into these questions, Andrews and Bromley compared forest areas by size classes for the years 1924 and 1939 and checked ownership plats in the wild-land sections.

It appears that a smaller area is now covered by trees of less than 3 inches in diameter; that a much larger area than formerly is in the 3-9 inch classes; and that there is no increase in the area of forests with trees of over 9 inches. There has been an increase of from 13 to 56% in the proportion of forested lands held by the public in the 15 year period 1924-1939," but the peak of movement of land into public ownership has been reached, if not passed."

Much more interesting than these results, however, is a bit of information, obtained in a very informal way, concerning the intent of ownership on the part of private holders of wild-lands. This little check-up shows that "only 3.5 percent of the wild lands seem to be held for timber and fuelwood production, and this includes areas where the timber will be cut in the next 10 to 20 years with no definite plans beyond that time." Half as much land is being held for oil production as is reported held for timber production! Apparently, most of the land in the wild-land zone is being held with the simple intent of getting rid of it, or with no particular intent at all.

Does this condition of intent of ownership not have implications that should cause us to reconsider our program so far as forest resources are concerned? One immediately is inclined to question predictions and programs that are suggested for a future forest economy when they have as a prerequisite condition the ownership of the wooded lands by persons interested in technical forest management, skilled in forest enterprises, aggressive, and interested in the local economy, and when the owners of only 2 per cent of such lands have an intent to produce timber and the owners of less than one per cent more are interested even in harvesting firewood. Again, of course, this is not to suggest that programs of forest improvement are undesirable. Rather it is to suggest that some of the most fundamental phases appear to remain untouched in the prevailing concepts of the region's problems.

The third aspect of the region's program as it has been visualized is recreation. Recreation has not been unimportant in the prevailing appraisal of the region's economy, but neither has it been the subject of very much special attention. This relative lack of emphasis is illustrated in the Andrews-Bromley study in the omission from the sample area of a portion of one county because, in part, it was too highly developed as a recreation area; in the complete omission of recreation from the study of "land use" changes; and in the fact that the section of the report devoted to recreation is almost wholly a generalized informal discussion based on random opinions.

Yet, the reader will agree with the authors in their conclusion that "Of all the uses to which rural land is put in these four counties, none seems to equal recreation in its potentiality for expansion in the near future." "The increase in the recreational business . . . during the past 15 years has been tremendous." Resort cottages have increased more than 300 per cent, and 95 per

cent of this increase has been in wild-land zones; and in these same zones, commercial buildings, other public buildings and improved roads have increased by marked percentages.

In one area, at least, "extensive areas . . . have been subdivided into thousands of very small lots (as resort properties), many of which may be miles from the water's edge." In fact, even the revival of the stump land into some kind of forest cover seems to be most important because of its tourist-attracting value.

The conclusions with respect to recreation are very vague and general. The recommendations of the National Resources Committee report regarding recreation are referred to; it is suggested that there is "need for some regulation and supervision of the recreation industry"; and a request is made for state machinery to expedite the study and control this development.

These references to the Michigan study have been made simply for purposes illustrative of the major theme of this paper. The careful reader will not interpret them as reproof of the report for obviously the authors met the purposes that they set for their work, the work was done well, and certainly some of the conclusions stated in the report are well founded. The "research fault" is not a mistake any more than a geological fault is a mistake. It is a misalignment of structure caused by a force underlying the surface horizon.

Taken in this view, the real value of the Anderson-Bromley report is in the very presence of this fault. For its presence reveals that a new institutional lag may be developing in our appraisal of the future economy of the northern Lake States region. And the beauty of the report, so to speak, is that the authors have included some sources of evidence, however informally developed, which go so far as to at least hint at what may be some of the more important considerations in the reappraisal.

Some items from other studies in the region have also given evidence of some of these same developing conditions. A few studies of recreation in the area have shown some of the characteristics of this development;[3] and some reports[4] have suggested that the local population is not entirely comprised of a farm or forest working force.

In our future attempts to formulate the problems of the region for analysis and to establish tentative hypotheses to guide such studies, it appears at this stage that the considerations listed below must play some part in orienting our concepts. And it seems reasonable to expect that if this is done, we may be pushed into recasting some of the proposals for regional programs which may otherwise tend to become stereotyped and inapplicable or to remain vague and indefinite.

Briefly, the main considerations apparently include:

1. The function of the region to harbor a resident population that has no present or intended interest in physically utilizing the soil or forest resources of the area but is interested in: (a) regular rural residence associated with near-by industrial employment, (b) irregular rural residence varying with employment in cities outside the region, and (c) retirement residence.
2. The meaning of a scattered pattern of ownership of land by persons not themselves interested in either the occupancy of the space or the physical utilization of the soil or forest resources within the space they control.
3. The implications of a dominant economic enterprise in recreational activities.

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[3] G. S. Wehrwein and K. H. Parsons, *Recreation as a Land Use*, Wis. Ag. Expt. Sta. Bul. 422, 1932; W. O. Hedrick, *Recreational Use of Northern Michigan Cut-Over Lands*, Mich. Ag. Expt. Sta. Spec. Bul. 247, 1934; G. S. Wehrwein and H. Johnson, "Zoning Land for Recreation," this issue.

[4] G. S. Wehrwein, "The Economic Status of Isolated Settlers in the Cut-Over Area of Wisconsin," *Jour. Land and Public Utility Econ.*, May, 1939; G. W. Hill and R. A. Smith, *Man in the Cut-Over*, Wis. Ag. Expt. Sta. Res. Bul. 139, 1941; J. E. Mason, *Isolated Settlement in Koochiching County, Minnesota*, U. S. Dept. of Agriculture, Mimeo. LE-8, 1940; F. M. Vreeland and E. S. Fitzgerald, *Farm-City Migration and Industry's Labor Reserve*, Works Progress Admin. Report L-7, 1939; U. S. Congress, Select Committee Investigating National Defense Migration, *National Defense Migration*, Parts 18, 19, Detroit Hearings, 1941.

Public Utilities Department

E. W. MOREHOUSE, *Editor*

In the Tradition of Dispassionate Inquiry

THIS may be called a "home-coming" issue of the *Journal*—the return of a native to home ground. Some of our present readers may not have realized or remembered that the *Journal* was originally conceived at Wisconsin; the editing of its first volume in 1925 was done at Wisconsin; the unique union of its principal fields of interest is a product of Wisconsin; and here these interests flourish with distinct vitality.

From Wisconsin, too, the *Journal* derived its editorial philosophy of encouraging "that continual and fearless sifting and winnowing by which alone the truth can be found." This principle has guided its editors from the beginning, seventeen years ago. It is fitting, therefore, that with this issue the *Journal* returns to its birthplace and, while a world is aflame, rededicates itself to carry on its tradition of dispassionate inquiry. As one of the *Journal's* original editors, and with grateful acknowledgment of the generous assistance of all those who enabled it to survive a period of deep depression to what is, for a periodical of this type, a relatively mature age, I welcome the *Journal's* opportunity to live and expand its usefulness on its native heath. I hope that its faithful supporters will continue to show their interest.

For the past several years this Department has served as an outlet for comments on significant items of research or interest in the field of public utilities. The editor of this Department has sought to include, not every current happening or bit of research in the field, but some of the more useful or interesting and likely-to-be-forgotten matters which otherwise might go unheralded.

Of late years a standard feature of the Department has been the continuing summary of public utility financing to aid readers in feeling the pulse of public utility capital markets. In addition, comments have been presented on selected court or commission opinions, research projects, divergent opinions with respect to major articles in prior issues, and miscellaneous topics.

It is earnestly hoped and requested that readers of this Department will freely contribute suggestions or, better yet, manuscripts and thus expand and strengthen its usefulness in the manner of its traditional zeal into the search after truth.

- E. W. MOREHOUSE

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Public Utilities and Unemployment Compensation

ALTHOUGH public utilities are widely regarded as highly stable industries they, along with other businesses, have been made subject to the unemployment compensation taxes for financing unemployment benefits. In most of the states a system of differential payroll taxes has ben put into effect, the tax levied against a particular company depending upon some measure of employment stability. Since the tax of differential payroll taxes has been put marily on its own experience, the method of levying is spoken of as "experience rating."

The minimum tax rate varies among the several states; in some, it is 1 per cent and reaches a low of zero in six states. The maximum varies from 2.7 per cent up and reaches a peak of 4 per cent in about 10 states.

The following tabulation indicates for the several states the potential savings which accrue to companies with regularized employment.

Potential Annual Payroll Tax Savings
Per $1,000 of Payroll [1]

Savings	No. of States
$10 to $16.99	2
17 to 19.99	7
20 to 24.99	5
25 to 29.99	11
30 to 34.99	4
35 to 40.00	8

These savings vary from $10 to $12 in Florida and Connecticut, respectively, up to $40 per $1,000 of payroll in Hawaii and Wisconsin. In general the laws are so drawn that every increment of regularization will tend to qualify the company for additional tax savings until lay-offs are completely avoided.

Theory of Experience Rating

The theory of unemployment insurance implies that once a worker has become identified with a given company for a certain period of time (depending upon the state law), that worker has a claim for a certain degree of continuity of income. To this extent, wage payments are no longer strictly variable costs; but are, within limits, overhead costs which the business must meet.

When unemployment compensation was first discussed in this country about a generation ago, the leading students of this problem—such as Professor John R. Commons of the University of Wisconsin and Louis D. Brandeis, later Justice of the Supreme Court,—and certain labor leaders took the view that if we were to adopt unemployment insurance, it should not be patterned after the European systems which had for the most part degenerated into doles or were threatening to do so. Rather, they argued, some attempt should be made to apply preventive measures, as had been done in workmen's compensation.

Because of the highly dynamic and expansionist character of the American economy, American employers had been rather profligate in the use of their labor power. Displaced or laid-off workers could go West, could find other jobs without undue delay. Nevertheless, a good deal of waste resulted from this careless use of labor power. The above-mentioned students of the problems of unemployment were certain that much of this carelessness in the use of labor was needless. In other words, unemployment was to some extent preventable.[2]

With this background in mind, the original Wisconsin law, passed in 1932, provided for variable payroll taxes depending upon the unemployment reserve fund that each company had built up through its payroll taxes. Subsequently, President Roosevelt, in recommending a broad program of social security urged that in the drafting of the unemployment compensation feature an attempt should be made to provide an incentive to stabilize operations. In 1935 the Social Security Act made provision for such a feature, and subsequently nearly 40 states and territories adopted some variant of the original Wisconsin plan on the theory that unemployment is to some extent preventable. This has been the most important argument for experience rating, although its proponents have never maintained that it alone will solve all unemployment problems.

Another argument for experience rating runs in terms of proper cost allocation. It would generally be agreed that a water works company should not be required to pay the real estate taxes of a shoe merchant or an electric utility. Similarly, the water works company should not be forced to finance the unemployment of a cast iron works or a ski factory. Why should the company which provides the most *employment* help to finance the company which is responsible for the most *unemployment*? Charging each company only with the unemployment for which it is responsible appeals to the American conception of individual enterprise and initiative.

Finally, experience rating is favored in order to "keep the program clean." That is, if some attempt is made to put the system on an employer-reserve basis with benefit payments chargeable against the individual employer, illegal claims, political pressure, and careless administration are mitigated.

[1] The tax applies only on first $3,000 earned by the employee in the year; the other state statutes either set no specific rates or do not provide experience rating.

[2] *Cf. e. g.*, John R. Commons, *et al.*, *Can Business Prevent Unemployment?*, Alfred Knopf, Publisher, 1925.

TABLE I. UNEMPLOYMENT COMPENSATION CONTRIBUTION RATES AND BENEFIT–EXPERIENCE IN WISCONSIN [a]

Industrial Classification	Number of Companies	Percent of Companies with Specified Contribution Rates in 1941						Cumulative Benefit Payments as a Percentage of Cumulative Tax Contributions through 1940
		Zero Rate	1.0% Rate	Standard Rate, 2.7%	3.2% Rate	3.7% Rate	4.0% Rate	
All Industries	9,641	23.9	41.2	26.0	5.2	2.3	1.4	26.5
Manufacturing	2,361	20.7	42.3	30.3	3.7	1.0	1.9	31.0
Wholesale Trade	1,088	29.2	47.1	19.9	2.8	0.6	0.5	12.5
Retail Trade	2,534	24.6	47.8	24.6	2.6	0.4	0.1	15.3
Finance, Insurance and Real Estate.	626	43.8	41.9	12.3	1.0	0.3	0.8	5.2
Service Industries	1,199	26.3	38.3	22.0	6.0	4.8	2.7	26.5
Agriculture, Forestry, and Fisheries	28	25.0	14.3	25.0	17.8	3.6	14.3	40.7
Mining	64	14.1	12.5	43.8	17.2	6.3	6.3	42.1
Construction	936	6.9	14.0	43.4	20.1	12.4	3.2	60.1
Transportation, Communication and other public utilities	407	18.9	49.1	25.1	5.2	0.2	1.5	10.7
Street & Suburban Rys., not operating bus lines	1	100.0	0.0	0.0	0.0	0.0	0.0	10.3
Street & Suburban Rys., also operating bus lines	2	100.0	0.0	0.0	0.0	0.0	0.0	3.7
City & Suburban bus lines	6	33.3	66.7	0.0	0.0	0.0	0.0	5.2
Bus lines other than city & suburban	6	0.0	100.0	0.0	0.0	0.0	0.0	4.4
Taxicabs	30	20.0	43.3	36.7	0.0	0.0	0.0	4.4
Communication: Telephone, Telegraph & Related Services	82	22.0	59.8	15.9	2.2	0.0	0.0	5.3
Telephone	80	21.3	60.0	16.3	2.5	0.0	0.0	4.8
Telegraph	2	50.0	50.0	0.0	0.0	0.0	0.0	10.8
Utilities: Electric and Gas	48	25.0	50.0	20.8	4.2	0.0	0.0	9.7
Electric Light and Power	26	19.2	38.5	34.6	7.7	0.0	0.0	23.7
Gas, Heating and Lighting	12	25.0	66.7	8.3	0.0	0.0	0.0	10.9
Elec. & Gas Utility Combined	10	40.0	60.0	0.0	0.0	0.0	0.0	8.7
Water Supply Systems	5	20.0	80.0	0.0	0.0	0.0	0.0	5.5

[a] Data based on reports from Wisconsin Industrial Commission. The tax applies only to employers with 6 or more employees.

Public Utility Tax Rates

The table indicates that all industries, nearly 24 per cent qualified in 1941 for the minimum rate which in Wisconsin is zero. Another 41 per cent qualified for the 1 per cent rate, indicating that about 65 per cent of Wisconsin employers are providing sufficiently regular employment to qualify for some reduction in payroll taxes. For the state as a whole, 26½c was paid in benefits to the end of 1940 for every $100 collected in contributions.

Sixty-eight per cent of the utility companies (compared with 65 per cent for all industry) qualified for some reduction in payroll taxes; the utilities paid out less than 11 cents for each dollar of tax contributions (compared with 26.5 cents for all industry). This apparent greater stability of the utilities may be attributed to the so-called "natural stability of the demand," but it is also due, at least in part, to deliberate attempts to improve the load factor in the face of heavy overhead costs.

A glance at the table indicates that, with the exception of mining and construction, the bulk of the companies are paying either the standard tax rate of 2.7 per cent on their payrolls or less. A sizeable but minority number of companies are being forced to pay penalty rates ranging from 3.2 per cent up to 4 per cent.

The table further reveals that in the case of public utilities, only 6.9 per cent of the companies paid penalty rates as against 8.9 per cent for all industries and 36 per cent in agriculture, forestry, and fisheries. It will be noted that among utilities, only in the case of telephones and electric light and power companies were any employers required to pay above the standard rate, indicating a substantial stability for utilities relative to industry as a whole.

The electric industry has paid out nearly 24 per cent of its tax contributions in the form of unemployment benefits and the gas industry about 11 per cent. In the 10 cases where the companies perform both gas and electric service, the unemployment benefit withdrawals have been less than 9 per cent of tax payments. All the combined service gas-electric companies qualified for tax savings, while in the case of both the electric companies and the gas companies the record is less satisfactory. These facts should be considered in the S.E.C. unscrambling program.

Conclusions

Public utilities with a heavy preponderance of fixed costs (costs which do not vary with output in the short run) now find that labor costs too have taken on a less variable character. Just as the burden of overhead costs has encouraged utilities to improve their load factors, so this added overhead will furnish additional impetus for steady operation. One thousand dollars spent for labor hours evenly spread throughout the year may exempt the company from any unemployment compensation taxes, or enable the company to qualify for the minimum tax rate; the same sum spent for labor which is irregularly employed may cost the company additional funds for financing the unemployment benefits collectable by the worker.

Wages as a proportion of gross receipts or of operating expenses vary enormously among utilities. For a hydro-electric generating company, wages may constitute less than 5 per cent of gross and in the case of a street railway company, the figure may reach 50 per cent. For this reason this new motive for steady operation will furnish varying degrees of additional incentives to discover ways and means of improving the "labor load factor."[3]

Fluctuation of investment is the essential characteristic of the business cycle; utilities in this respect have an inferior record, at least since 1929, to that of industry as a whole.[4] It is conceivable that the admirable record of the utility industry under experience rating (as shown by the Wisconsin figures) will draw the attention of management to the desirability of reducing boom-period plant expansion and planning on a long-term basis for less drastic contraction of new plant construction during slack periods. With the growing emphasis by the Federal Power Commission and others upon historical cost as *the* rate base determinant, the outlook is none too hopeful. Experience rating in the unemployment compensation laws, while probably not decisive in this respect, may at least be expected to encourage more orderly plant expansion than would otherwise be the case.

Instability with its accompanying unemployment of men and other resources is the greatest blot on the private enterprise system. Every element of additional stability attained tends to make the balance of the economy more stable, providing it is not secured through monopoly action.[5] For this reason experience rating in the unemployment compensation system constitutes a challenge to management in the utility as well as other industries.

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[3] A continuing series of case histories, each describing a specific company, of employment regularization is being published by the *American Legion Employment Stabilization Service*, McKnight Building, Minneapolis.

[4] Cf. Schmidt, Emerson P., *Public Utility Economics*, p. 74, John S. Swift Co., St. Louis, Missouri.

[5] For a significant demonstration of this see report of a recent investigation by Jack Chernick of the University of Minnesota, entitled, "The Effect of Industrial Stability Upon the Economy."

Recent Developments in Service Company Regulations

THE recent decision of the Securities and Exchange Commission in the New England Power Service Company case[1] throw considerable light on two problems: (1) the corporate and administrative organization of utility holding company systems; and (2) the policy of the Commission respecting the segregation of the functions of service companies from those of holding companies in the system.

1. *Corporate and Administrative Organization of Utility Holding Company Systems.* The New England Power Service Company appears at first glance to be an extreme type of service company because its functions are not limited to those usually associated with service companies, such as the handling of highly technical problems —rates, taxes, engineering design, etc.—but also include activities that are usually thought of as "operating company" func-

[1] *In the Matter of New England Power Service Company, et al,* Holding Company Act Release No. 3135, November 22, 1941.

tions – construction and maintenance of lines, inspection of relays, meter work, etc.[2]

The organization of the New England Power Service Company emphasizes the fact that companies should not be regarded as service companies because they perform functions traditionally regarded as "service company functions" but should be viewed as corporate and administrative devices for performing practically any type of function that might occur within a holding company system. The Commission has used the latter approach, and this order is a further illustration that the Commission has not adopted a hard and fast rule on the functions that might be performed by a service company insofar as those functions are related to the operations of utility companies. On this matter the policy has been to afford individual treatment to each service company and to permit the performance of the functions proposed if it appeared that it represented an efficient and economic method of doing the job.

The difficulty in this connection is to find objective tests of efficiency and economy. The New England Power Service Company case is of interest because it represents the first attempt of the Commission to make extensive use of statistical measures of efficiency and economy. A tabulation was introduced showing service fees as a percent of gross operating revenues for the New England Power Association and eleven other comparable holding company systems. Service fees as a percent of gross operating revenues were 5.68 percent for New England Power Association, and for the eleven other systems the percentages varied from 0.68 percent to 2.77 percent. The order concluded that "the tabulation at least shows that Respondents were under the obligation of giving a good explanation for their unique position in the servicing company field."[3]

Other statistical measures were introduced as indicative of the kind of job the service company had been doing. The findings show that there had been an upward trend in the operating ratios for this system form 1933 to 1940 and that on the basis of the average revenue per kilowatt hour sold to residential and rural customers the system was not "a leader in low rates." However, it was shown that the number of disturbances in utility service in the territory of one of the subsidiary electric companies had decreased fairly steadily from 1933 to 1939 and that the growth in the number of electric customers served from 1931 to 1940 was about equal to that experienced by all private electric companies in the four New England states in which this system operates and that from 1937 to 1940 the growth in this system was substantially better than average.

The validity of these statistical measures in determining efficiency was not tested because the respondents filed an amendment during the proceedings which provided for an extensive reorganization and which apparently satisfied the requirements of the Commission. It was estimated that as a result of the reorganization the percent of service fees to gross operating revenues would be 3.26 percent compared with 5.80 percent for the year 1940. If actual construction work expense is deducted, the percent of service fees for the reorganized service company would be 1.60 percent of gross operating revenues, an amount not greatly out of line with typical service company experience.[4]

2. *Segregation of Functions of the Service Company.* This case shows that the Commission continues its liberal policy as to the nature of functions which may be centralized in a service company if the functions are for the benefit of the operating companies. However, the Commission continues to insist that the service company desist from performing functions which benefit holding companies. The order in this case points out that the reorganization of the service company effects "a complete severance of the officers, directors and employees of the Service Company from the holding companies." The holding company

[2] Even in the "reorganized" service company it is proposed to have a Construction Department consisting of 247 employees, 203 of which would be foremen, mechanics, and construction laborers.

[3] *In the Matter of New England Power Service Company et. al., supra,* n. 1 at p. 6.

[4] "But analysis of the annual reports for 1939 of all service companies reveals that the cost of services to system companies was 1.62% of total gross operating revenues of the system." W. F. Kennedy, "I. Achieving Servicing at Cost." *Journal of Land & Public Utility Economics,* Feb., 1941.

will have a separate staff to perform the "holding-company functions" and the service company will be limited to rendering services needed by the operating companies.[5] Apparently the Commission has not insisted on absolute segregation of the service company because the order states that ". . . only services of an incidental nature will be rendered to the parent company by the reorganized service company."[6]

This order is an important land-mark in service company regulation because it represents a "middle-of-the-road" attitude on the problem of segregation of the service company from the holding company. Previous orders dealing with the problem of segregation revealed an intention of having the holding companies bear all the expenses for the performance of services judged to be holding company functions. The centralized performance of nearly any function (for example, the handling of rate problems by a centralized department for all companies in the system) yields benefits to both operating and holding companies, and perhaps to others. When the policy of segregation was adopted, it raised the question of whether the Commission in applying the doctrine would take a rigid view and reach the conclusion that practically all forms of centralized services yielded some benefits to the holding company as distinguished from the operating companies. Adoption of such a viewpoint would be tantamount to abolition of all service companies levying charges on operating companies.

The assignment of all costs of centralized servicing to the holding companies might prove so burdensome in some systems as to make it impossible for the holding company to meet the financial requirements of its capital structure, especially in a period when returns on common stock investments in operating companies are diminishing.

This case demonstrates that the Commission is not using Section 13 as a means of eliminating holding companies. The Commission still insists that holding companies employ their own staffs for handling matters of concern to the parent company, but apparently believes that it is possible to arrive at a fair determination of a proper assignment of centralized functions between the service company, acting in behalf of operating companies, and the holding company, acting in its own interest.

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[5] *In the Matter of New England Power Service Company, et al., supra* n. 1 at p. 13.

[6] *Ibid.* at p. 12.

Statistical Method: Forecasting Electric Energy Demand and Regulating Supply*

This paper outlines several statistical methods which have been used in forecasting energy demand and other economic variables. It also analyzes in general statistical terms the scheme of power allocation devised late during World War I in the U. S. to meet the problem of shortage. The aim of the paper is to present in systematic form some considerations basic to forecasting, priority rating and allocation.

A. Forecasting Demand

(a) The assumption made by Gates[1] is that there is a high degree of correlation, on a relative basis, between industrial production and the rate of demand for electric energy. That is, on the average $(E_2—E_1) / E_1 = (P_2—P_1) / P_1$, where E_1, E_2 are the blocks of energy demanded in successive units of time 1, 2 and P_1, P_2 are the corresponding measures of industrial production. The Federal Reserve Board index of industrial production was chosen for this purpose. The assumption is clearly very special. The slightly more general relation $(E_2—E_1)\ E_1 = K(P_2—P_1)/P_1$ is more readily acceptable. However, simplicity of computation and lack of information as to the precise value of K beyond that it is positive make the assumption $K=1$ convenient.

* Paper #220 from Department of Biostatistics, the Johns Hopkins School of Hygiene and Public Health, Baltimore, Maryland.

[1] Cf. "Forecasting the Demand for Electric Energy," J. E. Gates, p. 74.

The well-known, long-time upward trend in energy demand and possible dependence on such other economic variables as national income and general price level are neglected.

(b) A study by the National Resources Committee [2] of energy demand in the U. S. based on the period 1920-32 assumes linear dependence on time, on industrial production, and on consumer income adjusted for price level and a supposed lag of response in energy demand to income. The resulting formula fits actual energy consumption during 1920-36 rather well. After that period, the calculated energy demand depends on what values we choose to substitute for the production, income, and price series. Conservative values give a reasonably good prediction of demand for 1932 to 1940. Within the range of observation a better fit can always be had by assuming the time trend to be arbitrarily more complicated and by bringing in auxiliary economic time series. But mere success in curve-fitting or interpolation within the observed range is not synonymous with success in extrapolation or forecasting. It may very well be that successful description within the observed range assures failure at forecasting. The grounds determining the initial choice of independent variables and functional relationships between these and the dependent variable are important in evaluating a given procedure.

Lack of continuing comparability of economic time series is a general source of difficulty in forecasting that is illustrated in the N. R. C. study. The F. R. B. index has undergone two revisions since 1936, the most recent being made in response to the shock of war production. When socio-economic or political conditions change radically (as in the current shift toward a "total-war" basis), the constant coefficients of a forecasting formula determined from conditions existing in the prior period became patently inappropriate for the new period. The remedy may, however, be no more than an adjustment of the time series, or a change in the fineness with which the time scale is viewed. On the other hand, it may be held that the occurrence of novelty must presently destroy whatever value such methods may have in the short run. Even so, attempts at short and longer-run forecasting continue out of dire necessity. Short-run accounting methods assisted by simple methods, such as (a), are usually popular among critics of more ambitious methods. As a group, forecasters bring as much economic, mathematical, and statistical theory to the aid of common sense and fragmentary data as they think safe. The avoidance of "pitfalls" is a favorite sport on the way to successful forecasting over long periods of time and under varied conditions.[3]

(c) There have not been lacking pioneering efforts at logical formulation of the forecasting problem, to the end of intelligible, as well as merely successful forecasting. While little of the rational or empirical work in economics has been concerned with electric energy demand, this is perhaps an accident in the development of economic and engineering thought. Workers in the field of economics have, however, long used physical and mathematical analogies in stating and solving their problems.[4] While these analogies have not always appeared happy or even interesting to critical non-mathematical economists, the fact remains that one may in this manner draw upon a stock of ready-made physico-mathematical solutions. The literature is also saved a burden of empty disputes over priority in ideas. From the engineering point of view, the language of mathematics is accepted as a matter of course. Therefore, the issue of "realistic" versus "unrealistic" analysis so popular in economics should interest but probably will not detain, the engineer venturing into mathematical economics. The question has ceased to receive much attention from economists of the so-called econometric school whose published labors

[2] National Resources Committee, "Patterns of Resources Use," p. 98, Washington, D. C., 1938.

[3] G. Tintner, "The Analysis of Economic Time Series," *Journal American Statistical Association*, vol. 35, pp. 93-100, March, 1940. L. R. Hafstad, "On the Bartels Technique for Time Series Analysis," *Journal American Statistical Association*, vol. 35, pp. 347-61, June, 1940. L. F. Knudsen, "Interdependence in a Series," *Journal American Statistical Association*, vol. 35, pp. 507-14, September, 1940. R. W. Burgess, "The Whole Duty of the Statistical Forecaster," *Journal American Statistical Association*, vol. 32, pp. 636-42 December, 1937.

[4] M. Sasuly, "Generalized Multiple Correlation Series of Economic Statistics," *Proceedings*, American Statistical Association, pp. 146-52, March, 1930.

now run into many volumes.[5]

B. Electric Power Allocation in the U. S. During World War I

The appearance of local power shortages in the U. S. during the last war prompted the priorities committee of that day to issue a preference schedule for local use in allocating the supply.[6] We consider this case for the light it throws on the more general problem of allocation given a shortage of energy (or material).

For this purpose there were established four classes of plants or industries, I–IV; Class I was composed of those plants or industries deemed by the committee to be of exceptional importance in the prosecution of the war, so high in importance that their requirements must precede those of the remaining classes. A Class I rating was also accorded to smaller users to avoid economic disruption not justified by the small power savings. "Non-essential" uses, in effect, constituted the fifth grade. Consumption in these uses was supposed to have been reduced to a minimum before applying the schedule. Five classes of preference are thus implied in the power scheme, including the highest, the intermediate, and the lowest grades. The decision as to the working rating of any particular industry, plant, or use rested with the priorities committee, and was based partly on returns from the companies concerned. The relative priority weights proposed by the committee for distributing the residue among Classes II–IV in event of shortage are arbitrary. They will be seen below to fall within the general requirement that they be descending in order of magnitude proceeding from higher to lower grades of preference. Finally the excess of allotment over requirement in any sub-class was to be distributed among the remaining classes by extension of the rule.

The elements of this scheme and their interrelation are best understood in an algebraic presentation that lends itself to generalization. Five grades of preference i= 0,1,2,3,4, are assumed; i=0 corresponds by convention to the highest grade of preference.[7] Here i=4, in general, i=m=1,2,. . corresponds to the non-essential grade. Requirements in class i during a base unit period of experience are denoted p_i, and units of energy (or material) are chosen so that

$$p_0 + p_1 + \cdots p_4 = 1 \qquad (1)$$

The new-period requirements are denoted r_i and total R; in general R is greater or less than unity. Denote the allocations by a_i and their total by S, the new supply. Then the condition

$$R > S \qquad (2)$$

defines a shortage of material in the new period. By definition of R and S we have

$$r_0 + r_1 + \cdots r_4 = R \qquad (3)$$

$$a_0 + a_1 + \cdots a_4 = S \qquad (4)$$

The War I power allocation scheme assigned unlimited preference to the highest class, i=0. In general, however, a limitation may be placed even on the highest class of requirements, in which case the class of unlimited preference remains an unrealized abstraction. Here, however, we write

$$a_0 = w \quad r_0 = r_0 \qquad (5)$$

and

$$a_4 = w_4 \quad r_4 = 0 \qquad (6)$$

to express the War I treatment of the highest and non-essential grades of power use in event of R>S. The residue to be allocated among grades i=1,2,3, is then $S - r_0 = S - a_0$. A system of preferential weights W_i, i—1,2,3, arbitrary except for the condition that they be graded downward,

$$W_1 > W_2 > W_3 \qquad (7)$$

namely, that the lower grades have lower preferential weights, was then applied to the requirements r_i, i=1,2,3 according to the scheme

$$a_1 = (S - a_0)\, 5r_1/C \qquad (8)$$

$$a_2 = (S - a_0)\, 3r_2/C \qquad (9)$$

$$a_3 = (S - a_0)\, 2r_3/C \qquad (10)$$

The factor C follows from (4), (5), (6):

$$C = 5r_1 + 3r_2 + 2r_3 \qquad (11)$$

Past requirements p_i do not appear explicitly in this calculation. Insofar as they are employed in determining or estimating the new requirements r_i, and the assumption that old conditions persist in part into the new period is valid, weights p_i are in fact reflected in the a_i. That is, r_i and so a_i

[5] *Econometrica* 1932–.

[6] War Industries Board Circular #45, Washington, D. C., October 7, 1918. K. T. Keller, "The Power Situation During the War," pp. 47-8. Govt. Printing Office, Washington, D. C., 1921.

[7] This notation is used by author in discussing the statistics of grades and preferences: C. C. Lienau, "Bivariate Discrete Distribution in Certain Problems of Statistical Order," *American Journal of Hygiene*, May, 1941.

depend on p_i and other variables. The latter include the caprices of the estimater of requirements. The weights are

$$W_0=1,\ W_4=0 \qquad (12)$$
$$W_1=5r_1/C \qquad (13)$$
$$W_2=3r_2/C \qquad (14)$$
$$W_3=2r_3/C \qquad (15)$$

Finally, if for one class $a>r$ and for the two others $a<r$, the excess from the over-allotted class is distributed among the partly served classes, giving to each in the ratio 5:3:2. (The 5:3:2: ratio was recommended without explanation of grounds by the priorities committee; Cf. footnote 6.) If only one class is left incompletely served, over-allotments to the others are assigned to that class. No problem arises when $R<S$ whatever the value of S.

The criterion for an order of importance among the classes should, ideally, be logically justifiable and objective in its application. The weights, W_i should ideally be chosen at an optimum set of levels, considering the end to be served, in this case the prosecution of a war. In practice, classifications of use and importance are imperfect and the settling of the question of relative importance invariably involves subjective elements of judgment. These facts find their expression in the numerical arbitrariness of the weights W_i and in the lack of finality of the preferential rating of a particular plant. Past demands and the demands of the new period find their expression through p_i and r_i. The finding of the optimum or "best" set of allocation weights W_i in terms of these factors is the whole problem of supply, priorities and allocation. No mere mathematical theory of distribution can specify what the weights should be in numerical terms. The condition (7) only asserts what may not be denied; that demands are somehow *orderable* in relative urgency. It does not go on to say *how much different* numerically they are or should be for a given purpose. Experience (p_i) embodied in a forecast of new requirements (r_i) and modified by "good judgment" or other rating as to relative importance (5,3,2) in the face of necessity, combine in the number W_i. The analysis so stated carefully distinguishes the three weight-determining factors for purposes of separate consideration. (Circular 45 stated that it was not considered practicable nor was it intended that the formula should apply with literal and mathematical accuracy. Dissatisfied consumers were invited to state their cases to the War Industries Priorities Division and the power company concerned.)

In conclusion we note one of a number of directions that may be followed in generalizing the War I power allocation scheme, Given a shortage, no class is to be allotted more than its requirements. At least one class may be given full allotment. Even the non-essential class may be fully served. For completeness a stock-pile denoted say, m-1, or by some higher grade, may be assumed. In general, the weights will satisfy

$$O\leq W_m\leq_{m-1}\leq W_{m-2}\ldots W_1\leq W_0\leq 1 \qquad (16)$$

where $W_i=a_i/r_i$ (17)

in event that $R>S$ (2)

But if there is no shortage $R\leq S$ (18)

then, $W_1=1$

Finally, the weight W_i is to be chosen as some convenient function of previous requirements, new requirements, and a (perhaps subjective) schedule of descending relative priority weights (e.g., 5:3:2 of the power scheme).

The necessary distinction between *the ordinal number of the class of preference* i=0,1,..m, and *the degree W_i to which its requirement* r_i is satisfied by the allocation $a_i=w_ir_i$ is easily maintained by means of this notation. One convenient abstract array of points on the w-scale satisfies the condition that the classes of preference, i, are equi-distantly spaced in $o\leq w\leq|$. The set w_i is defined by

$$CW_2=1-\frac{i+1}{m+2} \qquad (19)$$

$$m$$

if $R>S$, then $a_i=w_ir_i$ (20)

and C follows from $S=a_0+a_1+..a_n$ (21)

Equation (18) is known in the theory of probability as the Law of Succession. In the present allocation context W_i may be interpreted as a conditional probability; namely, that the use i is served under the condition of a shortage $R>S$. For a completely served use w=1 ,an incompletely served use $O<W<I$, and a completely unserved use w=0. This junction between the theory of order probability and preferential allocation is suggested as a starting point for a full investigation of the allocation problem.

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Public Utility Financing in the Fourth Quarter of 1941 and a Summary of the Year, 1941

Fourth Quarter Financing

Public utility security offerings declined quite sharply during the fourth quarter of 1941, totaling only $177 millions as compared with $483 millions in the previous quarter and $606 millions in the fourth quarter of 1940. Not since 1937 has the total volume of fourth quarter financing been so light.

Long-term bonds excluding serial issues continue to make up a large part of total utility security flotations, accounting for 81% of the fourth quarter total while serial issues accounted for 11% and common and preferred stock issues for 4% each. While new offerings of common stock are still relatively small it is interesting to note that they have increased in volume during the past three quarters.

Over 70% of the long-term bonds sold during the quarter were offered publicly while a little less than 30% were sold privately. Public offerings make up a higher percentage of the total than in any other quarter in 1941.

Long-Term Debt Financing. The 31 issues in this classification are listed in Tables I and II for publicly and privately sold issues, respectively. Table I lists seven publicly sold issues, with offering yields varying from 2.55% to 4.18%. Five out of the seven issues are 30 year bonds and only one of the larger issues sold at a price to yield in excess of 3%. The weighted average yield at offering prices on publicly sold issues was 2.90%.

Underwriters' commissions were unusually low during the quarter, being less than 2% on five out of the seven issues listed and less than 1% on three issues. The weighted average was 1.24%. Previous to the date at which the SEC competitive bidding rule took effect (May, 1941), the lowest average for any one quarter since 1936 was 1.73%. This reduction in underwriters' commissions is reflected in a lessening of the differential between offering yields and costs to company on publicly sold issues. For example, the cost to the company on the Philadelphia Electric Company 3% bonds of 1971 was 2.61%, which is the lowest net cost recorded by any publicly sold long-term issue since 1936 in spite of the fact that several issues have had a lower offering yield.

Table II lists 24 issues which were sold privately during the quarter. These issues are much smaller, on the average, than those sold publicly, totaling only $43 millions as compared with $103 millions for the seven issues shown in Table I. The weighted average yield on privately sold issues for which price data are available was 3.26%. This compares with 3.12% in the third quarter.

Other Utility Financing. Issues with serial maturities offered in the fourth quarter are listed as follows:

$10,000,000	Public Service Company of Indiana, Inc., 2¼%-3% serial notes due 1942-1950.
9,000,000	Central Illinois Public Service Company, 3% serial notes due 1942-1951.
700,000	North Shore Gas Co., First serial 4¼'s due 1942-1948.
50,000	South Carolina Gas Co., 5% serial notes due 1943-1971.
$19,750,000	

Common stock issues offered during the quarter are listed below:

$ 100,000	Black Hills Power and Light Co., 100,000 shares of common stock ($1.00 par), offered at $16.50 per share.
3,525,000	Louisville Gas and Electric Co., 150,000 shares of common stock (no par), offered at $23.50 per share.
2,467,500	San Diego Gas and Electric Co., 246,750 shares of common stock ($10.00 par), offered at $13.00 per share.
242,340	Kansas-Nebraska Natural Gas Co., 48,468 shares of common stock ($5.00 par), offered at $6.50 per share.
$ 6,334,840	

Offerings of new utility common stock have been rare in recent years. Since the second quarter of 1941 signs of increased activity in this class of financing have been in evidence. Whether or not this is the start of a new trend in utility financing only time can tell.

Table III lists preferred stock issues offered during the quarter. Total offerings amounted to only $6,625,000 as compared with $27,774,600 in the third quarter and $61,602,475 in the fourth quarter of 1940.

Summary of the Year, 1941

The total volume of long-term public utility financing (bonds, serial notes, and preferred stock) in 1941 was slightly above the 1940 volume and about the same as in 1939. The volume of long-term financing has been about equal in each of the years from 1936 to 1941, inclusive. These data are shown in Table IV. As explained in a footnote to this table, no common stocks or short-term obligations, except serial notes with a term of 5 years or more, are included.

This table also reveals that the total amount of long-term bonds issued (public and private offerings combined) has also remained about the same in each year since 1939. However, the volume of public offerings of long-term bonds has decreased in each of the years from 1939 to 1941, inclusive. The opposite tendency is noted in private offerings of long-term bonds. The 1941 volume of private offerings ($736 millions) represents a new high for the period covered by this report.

Included in the third quarter totals are two extremely large American Telephone and Telegraph Company issues, amounting to $323,584,900 or 44% of the 1941 total. These issues were offered in September of 1941. This company's 3% convertible debentures of 1956 were dated September 1, 1941 and were offered to holders of the capital stock at par. The issue amounted to $233,584,900 and by September 3, 1941 slightly over 95% of this amount had been subscribed. The subscription rights were at the ratio of $100 of debentures for each share of stock held of record on July 25, 1941. Subscription price was $100 for each $100 principal amount thereof. The debentures are convertible into capital stock at any time after January 1, 1942 to and including December 31, 1954 (except in event debentures are called for redemption, such rights terminate at close of business on date fixed for redemption of such debentures). The conversion price subject to adjustment as provided in the indenture is $140 per share, payable by surrender of $100 principal amount of debentures and payment to the company of $40 cash for each share of stock. The market quotation of the convertible debentures as of February 6, 1942 was 108% of par while on the same day the common stock was selling at $128.50 per share. This issue has been classified as a private sale because it was not made available to the public generally.

The American Telephone and Telegraph Co. also issued $90,000,000 of 2¾% Debentures of 1976 in September of 1941. This issue was gotten out shortly after the convertible debenture issue. The entire amount was sold to an insurance group headed by the Mutual Life Insurance Co. at 101.842 or a yield rate of 2.67% to maturity. This compares with yield rate of 3% on the convertible debentures which were of shorter term (15 years as compared with 35 years).

The number of long-term bond issues sold privately has become increasingly more important in recent years. A table, including 1941 figures, which has appeared in previous annual summaries is repeated again:

Year	% of Public Utility Long-term Bonds Sold Privately*
1936	9%
1937	7
1938	23
1939	39
1940	37
1941	62

* Excludes serial issues.

The 1941 figure of 62% indicates a resumption in the trend toward private sale of long-term bonds after a slight decrease in 1940 over the 1939 percentage. In the third quarter of 1941 there was a particularly large proportion of private offerings (86%). Commentators stressed as an explanation the introduction of competitive bidding in this quarter. It is noteworthy that the proportion of long-term bonds sold privately fell to 24% in the fourth quarter of 1941. This was after there had been more experience with competitive bidding.

The volume of serial offerings was larger in 1941 than in 1940 but not as large as in 1938 and 1939. Serial offerings continue to be small in proportion to the volume of

other financing.

The volume of preferred stock offered in 1941 was considerably less than in 1940 and slightly below the 1939 total. The first two quarters of 1941 were about equal to the quarterly average for 1940 but a sharp decline in preferred stock offerings took place in the third and fourth quarters of 1941. If the cost of capital continues favorable it seems reasonable to expect a resumption in the refunding of presently outstanding preferred stocks issues in 1942.

Table III summarizes data on offering yield, underwriters' commissions, estimated incidental expenses, and net cost of bond capital to the company for the publicly offered long-term debt issues in each quarter of the years 1936 to 1941, inclusive. It should be borne in mind that the data on yields are not exact measures of shifts in interest rates. Variation in the quality of the issues offered in any particular quarter may well account for many of the changes in costs.

Study of the table reveals several interest-tendencies: 1. Offering yield on long-term debt issues showed little if any tendency to rise in 1941 from the low level reached in 1940. 2. There remains an almost complete absence of issues looked upon as being of doubtful investment merit. This is apparent because of the lack of issues offered at prices to yield 5% or more. 3. Underwriters' commissions have dropped considerably during 1941 while incidental expenses have remained about the same. The effect of the last item on the average spread between offering yield and net cost to company in 1941 has already been discussed in the section on fourth quarter financing.

The following table compares the average spread for the years 1936 to 1941, inclusive:

Year	Spread between offering yield & net cost to Co.*
1936	.18%
1937	.16
1938	.16
1939	.18
1940	.13
1941	.11

* Expressed as a percentage of par value issued.

The average spread declined in both 1940 and 1941. It is apparent that a significant narrowing in this important differential has occurred during the past two years.

The term in years of publicly and privately sold long-term bonds is summarized below.

There were 88 long-term debt issues of $1,000,000 or more par value offered in 1941, 64 being private and 24 public issues. The most frequent term was 30 years. The most frequent term last year was also 30 years. In the case of privately sold issues there were nearly as many 25 year term issues as there were 30 year term issues. In 1940 83% of the long-term debt issues of $1,000,000 or more par value had terms of 25 or 30 years, whereas in 1941, 77% had terms of 25 or 30 years.

High-Lights of the Year's Financing

Philadelphia Electric Co. First and Refunding 2-¾'s of 1971 in the amount of $20,000,000 sold at a price to yield 2.55%. The net cost to the company was only 2.61%.

Term in Years	Large Long-Term Debt Issues Offered during 1941 *			
	Number of Public Offerings	Number of Private Offerings	Combined Public and Private Number	Combined Public and Private Percent
Less than 20 years	2	8	10	11%
20	2	3	5	6
25	5	24	29	33
30	13	26	39	44
More than 30	2	3	5	6
Total	24	64	88	100%

* Excluding serial issues and issues of less than $1,000,000 par value.

This is the lowest net cost in this series. This issue compares with the former low of the Boston Edison Co. First 2¾'s of 1970 issued in 1940 which sold at a price to yield 2.51% and a net cost to the company of 2.62%.

Consolidated Gas El. Lt. and Pr. Co of Baltimore First and Refunding 2¾'s of 1976 sold at 103.50 to yield 2.60% and a net cost to the company of 2.69%.

Illinois Bell Telephone Co. First Mortgage 2¾'s of 1981 sold at 103.50 to yield 2.61% and a net cost to the company of 2.67%. This was a rather large issue amounting to $46,250,000.

Bell Telephone Co. of Pa, First and Refunding 2¾'s of 1976 sold at 100.00 to yield 2.75%. This issue was sold privately.

American Telephone and Telegraph Co. Debentures of 1976 sold privately at 101.842 to yield 2.67%. This issue totaled $90,000,000.

Ohio Power Co. 4½% Comulative Preferred stock, par $100, sold at 108 to yield 4.17%. This was the largest preferred stock issue in 1941, the principal amount being $20,240,000.

TABLE I. SUMMARY AND ANALYSIS OF PUBLIC UTILITY LONG-TERM DEBT ISSUES OFFERED PUBLICLY, FOURTH QUARTER, 1941

Company and Issue (A)	Coupon Rate (B) %	Principal Amount (C)	Maturity Date (D)	Month of Offering (E)	Offering (F) %	Offering Yield (G) %	Underwriters' Commissions (H) %	Proceeds to Company (I) %	Estimated Incidental Expenses (J) %	Net Proceeds (K) %	Cost to Company (L) %
Gulf Power Co. First Mortgage	3⅛	$ 5,600,000	1971	Oct.	103[a]	2.97	.7938	102.2062	[b]	[b]	[b]
Mississippi Power Co. First Mortgage	3⅛	8,927,000	1971	Oct.	102.45	3.00	.336	102.114	[b]	[b]	[b]
Central Ill. Public Serv. First Mortgage	3⅜	38,000,000	1971	Oct.	107	3.02	1.2103	105.7897	.3421	105.4476	3.10
Pacific Gas & Elec. Co. First and Refunding Mortgage	3	25,000,000	1971	Nov.	105	2.75	1.75	103.25	.52	102.73	2.86
Philadelphia Electric Co. First and Refunding Mortgage	2¾	20,000,000	1971	Nov.	104.176	2.55	.7216	103.4544	.5750	102.8794	2.61
Mobile Gas Service Corp. First Mortgage	3¼	1,400,000	1961	Dec.	104.68	3.43	3.98	100.70	1.81[c]	98.89	3.83
North Shore Gas Co. First Mortgage	4¼	3,700,000	1961	Dec.	101	4.18	2.75	98.25	.68[c]	97.57	4.43
Total or weighted average		$102,627,000			105.10	2.90	1.24	103.86	...	.....	...
Total or weighted average (Excluding issues for which incidental expenses are not available)		88,100,000			105.50	2.89	1.36	104.14	.48	103.66	2.99

[a] A portion of this issue ($3,000,000) was sold by the underwriters to an insurance company at 102.4562% of par.
[b] Not available.
[c] Pro rata share of expenses.

TABLE II. SUMMARY AND ANALYSIS OF PUBLIC UTILITY LONG-TERM DEBT ISSUES OFFERED PRIVATELY, FOURTH QUARTER, 1941

Company and Issue (A)	Coupon Rate (B)	Principal Amount (C)	Maturity Date (D)	Month of Offering (E)	Offering Yield (F)	Offering Yield (G)
Black Hills Pr. & Lt. Co.						
First Mortgage, A	3½%	$ 2,000,000	1971	October	103.75	3.30%
Derby Gas & Elec. Corp.						
Collateral Trust Deb.	3	2,750,000	1949	October	100.00	3.00
Mclaren-Quebec Power Co.						
First Mortgage	4	750,000	1959	October	98.00	4.16
New Haven Water Co.						
General & Refunding	3⅛	550,000	1976	October	[1]	[1]
Newport Gas Light Co.						
First Mortgage	3¼	400,000	1961	October	100.00	3.25
Peoples Gas Co.						
First Mortgage	3½	700,000	1961	October	100.00	3.50
Western New York Water Co.						
First Mortgage	3¾	3,000,000	1966	October	106.74	3.35
Sinking Fund Notes	3¾	1,400,000	1956	October	102.90	3.49
California Wt. & Tel. Co.						
First Mortgage	3⅜	5,850,000	1971	November	105.50	3.27
Northwestern Wis. El. Co.						
First Mortgage	3¾	75,000	1954	November	100.00	3.75
Public Elec. Lt. Co.						
First Mortgage	3¾	100,000	1961	November	[1]	[1]
Rawlins Elec. Co.						
First Mortgage	3½	200,000	1966	November	100.00	3.50
Sheridan County Elec.						
First Mortgage	3½	750,000	1966	November	100.00	3.50
Southwest Natural Gas Co.						
First Mortgage, A	3¾	1,850,000	1956	November	[1]	[1]
Trinidad El., Tr., Ry., & Gas Co.						
First Mortgage	3½	1,600,000	1966	November	100.00	3.50
Atlantic City Sewerage						
First Mortgage	3¾	1,450,000	1961	December	103.00	3.54
Albuquerque Gas & El. Co.						
First Mortgage	3½	267,000	1966	December	104.25	3.25
Central Main Pr. Co.						
1st & genl. mtge., L	3½	1,000,000	1970	December	111.00	2.93
Kentucky Utilities Co.						
First Mortgage	4	1,000,000	1970	December	106.50	3.64
Middle Western Tel. Co.						
Collat. Trust Deb.	4	425,000	1951	December	[1]	[1]
New Hampshire Gas & El. Co.						
First Mortgage, B	3½	1,000,000	1971	December	103.79	3.30
Northwestern Lt. & Pr. Co.						
First Mortgage	4	1,200,000	1966	December	[1]	[1]
Panther Valley Water Co.						
First Mortgage	3¾	1,000,000	1966	December	100.00	3.25
Pub. Serv. of Ind.						
First Mortgage, C	3⅜	13,200,000	1971	December	105.00	3.12
Total of All Issues		$42,517,000				
Total or Weighted Average (excluding issues for which complete data are not available)		$38,392,000			104.04	3.26%

[1] Not available.

TABLE III. SUMMARY AND ANALYSIS OF PREFERRED STOCK ISSUES OFFERED, DEBT ISSUES OFFERED PUBLICLY (EXCLUSIVE OF SERIAL MATURITIES), 1936 to 1941, INCLUSIVE *

Year and Quarter	Number of Issues	Offering Yields		Underwriters' Commissions		Estimated Incidental Expenses		Cost to Company	
		Range	Weighted Average	Range	Weighted Average	Range	Weighted Average	Range	Weighted Average
		% %	%	% %	%	% %	%	% %	%
1936									
1st	17	3.25–5.48	3.64	1.00–6.00	2.25	0.42–2.27	0.58	3.40–6.09	3.82
2nd	26	3.05–5.00	3.78	0.97–4.00	2.26	0.35–2.15	0.91	3.13–5.75	4.00
3rd	18	3.15–4.77	3.46	0.75–3.50	2.18	0.51–2.38	0.84	3.28–5.23	3.63
4th	32	3.00–4.87	3.37	0.74–3.25	2.06	0.23–1.68	0.54	3.12–5.38	3.51
1937									
1st	12	3.19–5.11	3.48	2.00–5.00	2.02	0.48–4.16	0.58	3.34–5.81	3.61
2nd	8	3.25–4.69	3.61	2.00–3.25	2.06	0.29–1.90	0.64	3.41–5.17	3.78
3rd	6	3.37–5.28	3.69	1.99–4.00	2.02	0.51–3.69	0.84	3.53–6.25	3.86
4th	5	3.50–4.56	3.82	2.00–3.50	2.12	0.62–1.62	0.88	? 99–5.23	4.05
1938									
1st	4	3.39–4.44	3.86	2.00–2.50	2.27	0.54–1.02	0.61	3.55–4.76	4.05
2nd	7	2.92–6.18	3.40	1.03–8.00	1.73	0.36–6.57	0.57	3.11–7.65	3.58
3rd	12	3.00–5.00	3.43	0.50–3.50	1.80	0.50–2.18	0.74	3.13–5.38	3.58
4th	12	3.01–6.20	3.44	0.96–5.00	1.98	0.32–3.33	0.58	3.15–6.91	3.59
1939									
1st	6	3.15–4.00	3.58	1.75–4.00	2.09	0.61–1.48	0.81	3.32–4.22	3.81
2nd	14	2.75–5.75	3.56	1.00–4.10	2.01	0.39–6.91	0.70	2.89–6.36	3.73
3rd	11	2.69–4.20	3.44	1.50–3.00	2.03	0.39–3.42	0.66	2.77–4.44	3.60
4th	8	3.02–3.89	3.63	1.50–2.75	1.99	0.58–1.02	0.71	3.20–4.10	3.80
1940									
1st	12	2.47–4.36	3.23	1.50–2.50	1.99	0.39–0.94	0.49	2.69–4.63	3.38
2nd	4	2.78–3.36	3.29	2.00–2.00	2.00	0.66–0.95	0.71	2.92–3.56	3.47
3rd	8	2.73–4.38	3.10	2.00–3.50	2.05	0.41–1.31	0.59	2.85–4.80	3.24
4th	14	2.51–4.50	2.81	0.50–4.00	1.75	0.36–2.81	0.51	2.62–5.06	2.91
1941									
1st	12	2.60–4.75	2.86	1.50–3.00	1.79	0.45–3.40	0.59	2.67–5.38	2.97
2nd	5	3.00–4.07	3.36	1.75–3.00	1.91	0.37–0.66	0.49	3.11–4.27	3.51
3rd	1	2.90–2.90	2.90	1.29–1.29	1.29	0.58–0.58	0.58	3.00–3.00	3.00
4th	5	2.55–4.18	2.89	0.72–3.98	1.36	0.34–1.81	0.48	2.61–4.43	2.99

* Excluding issues for which complete data are not available.

TABLE IV. VOLUME OF PUBLIC UTILITY FINANCING, BY QUARTERS 1936 TO 1941, INCLUSIVE *

Year and Quarter	Long-Term Bonds†				Serial Offerings‡		Preferred Stock ‡		Total in Millions
	Public Offerings		Private Offerings						
	Millions	Per Cent of Total§	Millions	Per Cent of Total§	Millions	Per Cent of Total§	Millions	Per Cent of Total§	
		%		%		%		%	
1936									
1st	$ 364	86	$ 56	13	$ 4	1	$ —	—	$ 424
2nd	510	83	28	4	54	9	24	4	616
3rd	238	76	71	23	1	—	4	1	314
4th	719	93	31	4	—	—	19	3	769
Total	$ 1,831	86	$186	9	$ 59	3	$ 47	2	$ 2,123
1937									
1st	$ 274	72	$ 19	5	$ —	—	$ 85	23	$ 378
2nd	185	92	10	5	4	2	1	1	200
3rd	66	73	3	3	18	20	4	4	91
4th	87	80	11	10	10	9	1	1	109
Total	$ 612	79	$ 43	5	$ 32	4	$ 91	12	$ 778
1938									
1st	$ 106	68	$ 49	31	$ —	—	$ 1	1	$ 156
2nd	179	75	55	23	2	1	2	1	238
3rd	240	73	81	25	5	2	1	—	327
4th	350	69	81	16	55	11	19	4	505
Total	$ 875	71	$266	22	$ 62	5	$ 23	2	$ 1,226
1939									
1st	$ 96	64	$ 18	12	$ —	—	$ 36	24	$ 150
2nd	203	46	181	42	3	1	48	11	434
3rd	247	64	63	16	32	8	47	12	389
4th	155	43	183	50	22	6	4	1	364
Total	$ 699	53	$445	33	$ 57	4	$136	10	$ 1,337
1940									
1st	$ 141	54	$ 59	22	$ 10	4	$ 53	20	$ 263
2nd	52	29	80	45	3	2	43	24	178
3rd	137	56	84	35	6	2	17	7	244
4th	360	59	179	30	5	1	62	10	606
Total	$ 690	53	$402	31	$ 24	2	$175	14	$ 1,291
1941									
1st	$ 164	39	$197	47	$ 5	1	$ 52	13	$ 418
2nd	149	52	81	28	16	5	43	15	289
3rd	32	7	415	86	5	1	28	6	480
4th	103	60	43	25	20	12	6	3	172
Total	$ 448	33	$736	54	$ 46	3	$129	10	$ 1,359

* Exclusive of short-term obligations (other than serial issues) and common stock issues. No attempt has been made to summarize short-term borrowings because of the impossibility of obtaining complete data. Public offerings of common stock have been negligible throughout the period.

† Exclusive of serial offerings.

‡ Includes issues sold privately as well as publicly.

§ Per cent of each type of financing to the total in the quarter shown in the right hand column.

TABLE V. SUMMARY OF YIELD AND COST DATA OF PUBLIC UTILITY LONG-TERM FOURTH QUARTER, 1941

Company and Issue (A)	Dividend (B)	Principal Amount (C)	Month of Offering (D)	Offering Price (E)	Offering Yield (F)
	%				%
Lexington Telephone Co. Cum. Pfd., $100 par	5.20	$ 800,000	October	$106.00	4.91
Black Hills Pr. & Lt. Co. Cum. Pfd., $100 par	5.00	850,000	October	100.00	5.00
Pacific Gas & Electric Co. Cum. Pfd., $25 par	5.00	4,375,000	November	27.00	4.63
Mobile Gas Service Corp. Cum. Pfd., $100 par	6.00	600,000	December	92.50	6.49
Total or weighted average		$6,625,000			4.88

R. G. DUDLEY
Statistician
Public Service Commission of Wisconsin
W. H. EVANS
Assistant Rate Analyst
Public Service Commission of Wisconsin

Book Review Department

Wickizer, V. D. and Bennett, M. K. "THE RICE ECONOMY OF MONSOON ASIA," *Stanford University, California: Food Research Institute, in cooperation with the International Secretariat, Institute of Pacific Relations, 1941. pp. 358. $3.50.*

The authors present in a descriptive and analytical manner the economics of rice production, consumption, and trade in the most intensive rice producing and consuming area of the world, Monsoon Asia, and it is done in a clear-cut, scholarly fashion. Monsoon Asia, as used in this book, refers to "an area which extends across the southeastern part of the continent of Asia from India to Japan, and includes practically all of the adjacent tropical and sub-tropical islands." Monsoonal climatic conditions profoundly influence agriculture and the life of the people in this vast area. Here, as is pointed out, 95% of all the rice is produced and consumed.

This is not just another treatise on rice, of which there are many in existence. It is a pioneering work in that it is a first attempt to quantitatively analyze statistics of production, trade, and consumption covering this entire area for a period of about three decades. This was a large and difficult task, which only seasoned researchers could perform so adequately, for the "factual information necessary for an appraisal of (the position of rice) in the world's economy is scarce, faulty, or altogether lacking." Therefore, throughout the book, the reader is reminded that the statistical data may not be complete or even accurate and that the conclusions and interpretations may have to be modified if and when more information becomes available. Despite these admitted shortcomings in the available data, the reviewer was impressed with the substantial amount of data that the authors were able to compile from the various source materials and from field investigations by one of the authors.

A fair balance is maintained throughout the book between the discussion of the economic aspects and the physical problems of production as well as between the purely descriptive material and the analytical. Opening with a discussion of the geographical setting of rice production and the cultural practices found in the numerous producing areas, detailed descriptions of marketing, exporting and importing, consumption, and price factors and price relationships follow in their order. The chapter on government intervention and price-control schemes indicates that the oriental countries attempted to solve the pressing price problems for their producers much as occidental nations have for theirs, and with apparently the same difficulty. After noting from the statistical evidence at hand that in the leading nations in Asia rice consumption is tending downward, two chapters are devoted to an inquiry into the possibilities of increasing the yield and acreage of rice production. The authors conclude that both are possible in a number of places in the monsoon area. Besides footnoting generously on about three-fourths of the pages in this volume, the authors present, in the appendix, nine tables of statistical data and twelve pages of "statistical notes" showing the sources for the rice statistics used and the methods of conversion followed. This appendix is a valuable addition in a pioneering work of this kind.

The publication should prove to be of interest not only to agricultural economists, but to geographers, nutritionists, marketing specialists, students of foreign trade, and to those economists who are interested in such specialized subjects as the pressure of population upon the food supply. Indeed, the authors made the latter problem one of their chief inquiries, and comment in the closing pages of the volume, "If population pressure on the land, already strong, continues to grow, and if expansion of the aggregate rice output can be effected only with difficulty, the question of the adequacy of food supply may be raised for rice in Monsoon Asia more appropriately than it was for wheat by Sir William Crookes in 1898. This is not to say that famine will face millions of people. . . . But increasing pressure upon food resources taxes man's ingenuity in making adjustments, and under certain conditions the result is a gradual lowering of consumption levels. This, ap-

parently, is what has been happening on a large scale in Monsoon Asia during the past decade or so." Followers of Malthus will welcome the statistical contributions made by the authors. This volume should also prove to be a valuable source book in courses dealing with contemporary agricultural economies and land economics.

In the director's preface to this volume, the statement is made that "it is hoped that this book will not only help to fill the need (of showing quantitatively the position of rice in the agriculture, trade, and consumption of Monsoon Asia) but also contribute to a better understanding of Far Eastern food problems, at a time when many eyes are turned toward the Orient. . . ." In the opinion of the reviewer the book does just that at a most propitious time.

MARVIN A. SCHAARS
University of Wisconsin

Gordon, Wendell C. EXPROPRIATION OF FOREIGN OWNED PROPERTY IN MEXICO. *Washington, D. C.: American Council on Public Affairs, 1941. pp. viii, 201.*

This is a very timely study of a problem that has long been a strain on our relationships with our sister republic on the south. Although oil properties are by no means the only form of property that has been expropriated in Mexico, the bulk of the text is concerned with this part of the problem. Lands and railroads have suffered similar experiences.

The author has set forth about as impartial and objective analysis of this problem as could be done and he states that as matters stand "the dispute is likely to drag on over a period of years, never arriving at a satisfactory solution, but continually generating ill will, until it perhaps is forgotten at last."

He says there are two sets of forces influencing the Mexicans in their handling of these problems of expropriation: they are nationalism reacting against foreign capital and influence, and the internal struggle of the poor versus the rich. Really these are the forces that have created the problem and since they are forces still in existence they are factors that must be considered in any solution of the problem.

The economic plan presented by the delegates from the United States to the American Conference of foreign ministers meeting in Rio recently would undoubtedly have had some effect on this issue had it been adopted. As the war progresses, and should it come nearer and nearer to the Western Hemisphere, the more likely is this plan or some form of it to be adopted. This in turn will tend to soften the nationalistic impulses of the Mexican people although it is not likely to lighten the economic burdens of the masses.

This book clearly points out that all the sins, both of commission and omission, have not been on the part of the Mexican Government or its people. Often times it has been a case of the pot calling the kettle black, which fact has not made the settlement of the issues any easier.

Samuel Guy Inman in his foreword emphasized that if the people of the United States have shown that they refuse to cherish institutions that stood in the way of their national progress, it is time to realize that Mexico is fully entitled to work out her destiny in the same manner. "If the New Deal in the United States sincerely hopes to bring its hemispheric ideals to fruition it will have to decide that property interests are less important than the well-being of Mexico." He thinks we have dealt loosely enough with private property in our own country and it would be naive to accept the idea that in Mexico private property is sacred.

The author deserves much credit for his painstaking labor in making this study and he has succeeded in adding a valuable contribution to the growing body of literature on our Latin-American relations. On the front cover, inside, is a statement of the present status of this problem. On November 19, 1941, the United States and Mexico reached agreements laying the groundwork for the settlement of the problems reviewed in this study.

LEONARD LOGAN
University of Oklahoma

NATIONAL ASSOCIATION OF ASSESSING OFFICERS. ASSESSMENT ORGANIZATION AND PERSONNEL. *Chicago: National Association of Assessing Officials, 1941, pp. vxi, 429.*

This book is of interest and value to all who have an interest in local government as a whole. Practically all the conclusions

can be applied to local governmental practices in general.

The book shows 26,300 primary assessment districts and at least 6,300 overlapping assessment districts to exist in the United States. These districts range in population from about half a dozen to nearly 7½ million persons while the values range from $25,000 to over $165,000,000,000. The delimitation, organization and staffing of these districts follows an almost infinite variety of patterns. The authors have shown by means of statistics, pertinent, concrete examples how one of the most important responsibilities of government, that of determining the base upon which the general property tax is to be spread, rests upon local assessing organizations inadequate for the proper conduct of such work. The need for revisions of procedure are clearly indicated and specific suggestions are made as to how improved assessment administration can be obtained.

The chapter which treats with overlapping assessment districts shows that two or more different property assessments may be made of the same identical property because of superimposed assessment authorities with a consequent duplication of effort and expense, to say nothing of the general confusion resulting from such practices.

The local district assessment organizations have been found totally inadequate for making sound valuations of certain types of property, and for this reason the responsibility of assessing certain property has been turned over to state authorities. The chapter on State Assessment Districts indicates the entent to which public utility properties, intangibles, mineral properties, motor vehicles, and other special properties are now assessed through state central agencies.

In the chapter dealing with the organization of assessment departments, tenure, compensation, and personnel administration, the authors have enunciated sound principles which could well serve as a guide not only for effective assessment organization and personnel but other branches of government service as well. Probably no more progressive step could be made in local American governmental procedure than the adoption of the principles set forth to the effect that, for an office requiring a high degree of professional skill such as assessing, a district should be established large enough to support a full time staff devoting its entire efforts to such work functioning through a staff selected in accordance with sound principles of personnel selection.

The book demonstrates that there should be levels of administrative review through which a taxpayer may carry an appeal—preferably a local, inexpensive, and conveniently located board which can correct simple errors of judgment through informal hearings ,and also a competent state agency for more formal hearings.

The book is a well organized, impartial and thorough presentation of assessment organization and personnel conditions. The authors are to be particularly commended because of the way in which they have adhered to the subject and avoided excursions into other phases of the assessment and taxation function. The book is a practical discussion of assessment organization, first presenting the situation as it exists, second analyzing this condition, and third, outlining sound and practical policies for improving the work of assessing offices. Probably every student of taxation will find minor points of fact or interpretation with which he is not wholly in accord, but the fundamental problems have been well explored and the book lays a sound and much needed foundation for effective revision of assessment administration.

H. R. Briggs
Director, Agency of Economic Research
Madison, Wisconsin

Lentz, Gilbert Gillespie. The Enforcement of the Orders of State Public Service Commissions. *Urbana, Illinois: The University of Illinois Press, 1940. pp. 159, $1.50.*

This monograph is one of a series of Illinois studies in the Social Sciences and represents a closer examination of that phase of American Administrative Law which is concerned with the enforcement of orders of public service commissions. After a preliminary discussion which serves to orient the problem of administrative enforcement in general and a short review of the development of our public utility regulating commissions, the author comes to grips with his special problem. His conclusion is fore-

shadowed by this illuminating paragraph which appears early in the study: 'The courts have been willing to concede to the commissions the use of processes that "resemble' judicial processes so long as their doing so does not limit the courts in their jurisdiction to determine judicial questions. In a word, the courts have been willing to share but not relinquish their judicial position, and the reconciliation of the commissions with the doctrine of the separation of powers rests mainly upon that attitude."

In successive chapters, enforcement problems are examined under these headings: (1) application of fines and penalties, including reparation orders; (2) actions to compel compliance by means of the judicial writs of mandamus and injunction; (3) use of the court's power to punish for contempt; (4) direct powers of enforcement conferred upon the commissions themselves, as in California, Oklahoma, Louisiana, and Virginia; (5) a discussion of prosecuting officers and agencies where the relation of various officials to the enforcement problem is briefly reviewed; and finally (6) a treatment of administrative and review procedure in which the more recently adopted methods of rendering commission determinations somewhat more effective are briefly surveyed.

The author comes to the conclusion that the original pattern, i.e., applying the analogous enforcement procedures available for legislation in general, had to be modified to take account of the fact that commission orders are evolved by a different process than legislation; that utility regulation performs a different function, is more experimental in nature, and requires different tests of validity. Hence the courts, while expressing "complete sympathy with the ends which the legislature and the commissions have sought to attain" have nevertheless criticized commission procedures.

In general, the study confirms that there is not much difference between the effectiveness of enforcing powers used by commissions directly (where the commission is a court of record) or indirectly (where the commission seeks the aid of the courts). In both cases there exists ample opportunity either of "appeal" to a higher court or of an action to "review". There is little evidence that, where summary processes are available to the commission, their acts have become arbitrary. Much depends upon the competence of the commission personnel, the judicious use of such enforcing powers as they do have in connection with their other powers to grant rehearings, to modify, suspend or revoke orders or by issuing preliminary "cease and desist" orders. The effectiveness of regulation is not judged alone by the number of cases in which the courts have refused or consented to enforce commission orders but by the intangible factor of commission influence in securing voluntary compliance with their recommendations without resort to legal enforcement machinery. This essay is well worth careful study by those interested in the technical aspects of commission procedure.

MARTIN G. GLAESER
University of Wisconsin

Waterman, Merwin H. "ECONOMIC IMPLICATIONS OF PUBLIC UTILITY HOLDING COMPANY OPERATIONS," *Michigan Business Studies, Vol. IX, No. 5, 1941. pp. 180. $1.00.*

Mr. Waterman's study is a statistical analysis designed to raise significant doubts as to the reasonableness and wisdom of the "death sentence" clause of the Public Utility Holding Company Act of 1935. Through this statistical approach he has endeavored by means of a comparison between "independent public utilities" and holding company subsidiaries to demonstrate that the interests of both the consumer and investor have been, on the whole, best served by the holding company systems. He attempts to illustrate this point by the use of certain objective criteria such as costs of service to the residential user, economy of management, and protection afforded the investor. In general it may be said that the evidence was largely in favor of the holding company subsidiaries over the "independent" companies. As a part of the general treatment Mr. Waterman also illustrates statistically that there is "considerable reason to doubt the coincident examples of bigness and inefficiency"; further, that there is little apparent correlation between efficiency of operations and the distance of the holding company headquarters from the actual operating subsidiary; and lastly, that adequate regulation of the holding company systems

could be effected without the "unreasonable" extremes proposed by Clause 11 (b) (1) of the Act.

Of course, the center of Mr. Waterman's argument as to the unreasonableness of Clause 11 (b) (1) rests upon the idea that with the administration of the above clause "such holding companies as are permitted by law to continue in existence must necessarily have or take on many of the characteristics of independent utilities." He consequently treats as "comparable" the "independent" utilities and those utility systems which will be evolved through the administration of the Act. Considerable doubt may be expressed as to whether this comparison is a just one. Neither the clause itself, nor the Commission's interpretation of the clause would seem to indicate that any such "unreasonable" interpretation is to be taken. Rather, the greatest of consideration is being accorded those economies which are the resultant of consolidation.

On the whole, however, Mr. Waterman's study must be credited with raising considerable doubt as to the advisability of unrestrained disintegration, for his comparison of the holding company subsidiaries and the "independent" utilities certainly indicates that there are definite limits to any program designed to eliminate the evils of the holding company system.

JOHN R. HENSON

Madison, Wisconsin

Crumbaker, Calvin. TRANSPORTATION AND POLITICS. *Eugene, Oregon: University of Oregon, 1940. pp. v, 169. $1.25.*

The sub-title is "A study of long-and-short-haul policies by Congress and the Interstate Commerce Commission." The Commission's efforts to administer the long-and-short-haul provisions of section 4 of the Act before and after 1920 are reviewed in considerable detail and the effects of the amendments to, and the changes in the law weighed and analyzed. In denying the application of the transcontinental carriers for relief, the Commission was influenced by the policy of Congress expressed in the Transportation Act of 1920—"to promote, encourage, and develop water transportation, service and facilities in connection with the commerce of the United States and to foster and preserve in full vigor both rail and water transportation." In carrying out those statutory directions the Commission approved a rate structure which tended to preserve the water carriers by preventing the rail carriers to compete for certain classes of traffic through rate adjustments. It is the author's contention, in his analysis of I. C. C. decisions, that the Commission "makes itself a superlegislative body to review the decision of Congress."

In a chapter on Commission and Congressional pressure methods it is pointed out that the so-called policies of Congress are in most cases committee policies and may be controlled by minority groups; that the independence of the Commission may also be affected by the nominating power of the President with respect to Commission appointments and by the confirmation power of the Senate.

More effective regulation of all competing carriers will nullify the importance of the long-and-short-haul controversy: members of Congress must also be guided in their law-making by sound economic principles. The whole study is provocative of thought and goes to the very heart of the country's problem involving the regulation and supervision of the transportation industry.

HENRY R. TRUMBOWER

University of Wisconsin

Bonbright, James C. PUBLIC UTILITIES AND THE NATIONAL POWER POLICIES. *New York: Columbia University Press, 1940. pp. vi, 82. $1.25.*

In this book, composed of four lectures and an article "Public Ownership and the National Power Policy" reprinted from the *Yale Law Review*, the author presents a succinct, non-technical summary of electric utility regulation and present national power policies. The usual generalizations concerning early attempts at regulation, the powers of commissions, and the reasons for utility regulation are followed by a discussion of rate regulation under the "fair value" doctrine which the author believes impractical.

Both the disrepute of regulated private ownership and the inadequacy of regulation, insofar as each exists, are attributed to the handicap imposed by the "fair value"

rule of rate-making, particularly in its administrative deficiencies. Professor Bonbright believes that a flexible position permitting of experiments in rate control is preferable to the "prudent investment" principle of valuation as a basis for rate-making. He notes the increased demand that has followed rate reductions in many areas and suggests that rate reductions by private firms have resulted from actual or potential competition from public plants rather than from actions of public service commissions.

After pointing out the abuses concomitant with the growth of the holding company, the author briefly surveys and favorably appraises the three-fold federal power policy, which includes the attempts at more effective regulation, the public power program, and rural electrification. In conclusion, the author sketches the arguments for public ownership, the problem of subsidization, and the practicability of co-existent private and public ownership.

The summary character of the book precludes desirable empirical support of many broad generalizations but the author himself refers the reader to opposing views.

WILLIAM V. WILMOT, JR.

Madison, Wisconsin

CONSERVATION OF SCHOLARLY JOURNALS

The American Library Association created this last year the Committee on Aid to Libraries in War Areas, headed by John R. Russell, the Librarian of the University of Rochester. The Committee is faced with numerous serious problems and hopes that American scholars and scientists will be of considerable aid in the solution of one of these problems.

One of the most difficult tasks in library reconstruction after the first World War was that of completing foreign institutional sets of American scholarly, scientific, and technical periodicals. The attempt to avoid a duplication of that situation is now the concern of the Committee.

Many sets of journals will be broken by the financial inability of the institutions to renew subscriptions. As far as possible they will be completed from a stock of periodicals being purchased by the Committee. Many more will have been broken through mail difficulties and loss of shipments, while still other sets will have disappeared in the destruction of libraries. The size of the eventual demand is impossible to estimate, but requests received by the Committee already give evidence that it will be enormous.

With an imminent paper shortage attempts are being made to collect old periodicals for pulp. Fearing this possible reduction in the already limited supply of scholarly and scientific journals, the Committee hopes to enlist the cooperation of subscribers to this JOURNAL in preventing the sacrifice of this type of material to the pulp demand. It is scarcely necessary to mention the appreciation of foreign institutions and scholars for this activity.

Questions concerning the project or concerning the value of particular periodicals to the project should be directed to Wayne M. Hartwell, Executive Assistant to the Committee on Aid to Libraries in War Areas, Rush Rhees Library, University of Rochester, Rochester, New York.